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VIRGINIA'S TIMBER

by

Robert W. Larson and Mackay B. Bryan

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HIGHLIGHTS

The immediate outlook is quite favorable. Current growth is adequate to provide forest industries with the amount and kind of timber they are now using. Although low-quality hardwoods are increasing very rapidly and replacing pine over a wide area, these inroads are being offset by hardwood control, by planting of pine, and by the natural seeding-in of pine on abandoned farm land. As a result, pine is just about holding its own.

The expected increase in need for timber makes the long-term outlook not quite so favorable. Although Virginia has the capacity to grow 50 to 75 percent more timber, vigorous action will be needed to realize this potential. It will mean the removal of low-quality hardwoods on several million acres to make room for pine and better hardwoods. Planting on much of this area and on about 1½ million acres of abandoned cropland will be essential.

U. S. Department of Agriculture
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Southeastern Forest Experiment Station
Joseph T. Pechanec, Director

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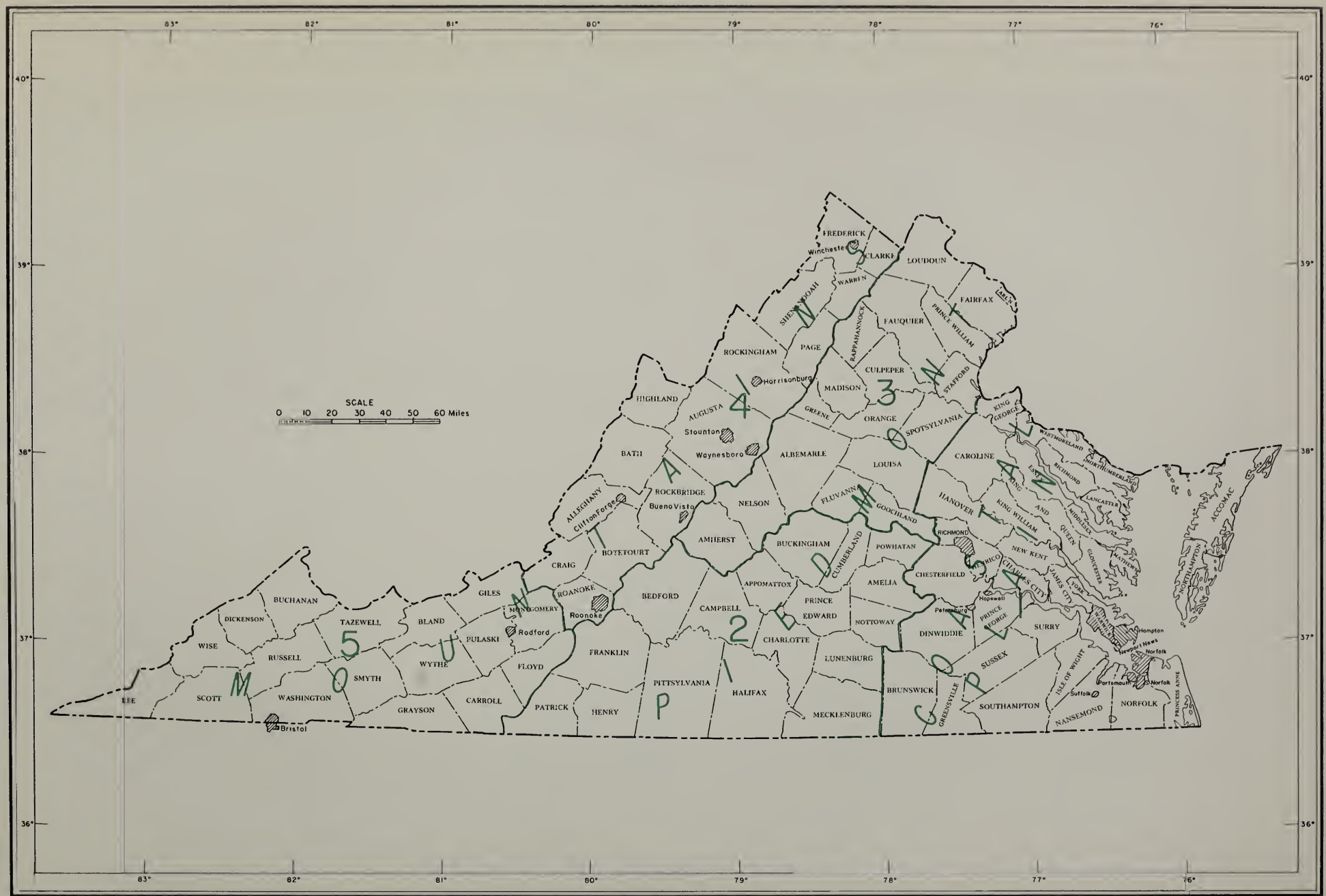

Forest Survey Units in Virginia.

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In July of 1957, a new survey of Virginia's forest resources was completed. During the 17-year interval since completion of the first survey in 1940, the timber supply outlook for the State has undergone a number of important changes. Timber cutting, growth, changes in land use, improved forest practices, and natural ecological trends in the forest stands have all contributed. Some changes have been desirable, but many have not. The findings of the new survey provide a means of evaluating trends in terms of amount and kind of timber that may be available to forest industries in the future. They also point to some of the problems Virginians must face in reversing undesirable trends and fostering those that are favorable.

TRENDS IN TIMBER USE

Timber Use Increasing

Currently, 412.2 million cubic feet of timber are cut annually from Virginia's forests (fig. 1). This is 18 percent above the cut in 1940 and 9 percent above the average for the period 1940 to 1956. Because of a drop in the softwood cut, less timber was cut in 1956 than in 1952 (fig. 2), but this may represent a short-term fluctuation rather than a reversal in the long-term upward trend.

Figure 1.—The trend in timber use in Virginia is up. Current cut is 18 percent above the 1940 cut. (Virginia Division of Forestry photo.)

The biggest increase in timber cutting took place in the coastal plain, where the volume of timber cut is now 24 percent greater than in 1940. Timber cut has increased 21 percent in the Piedmont since 1940, but in the mountain area cutting has decreased by 5 percent.

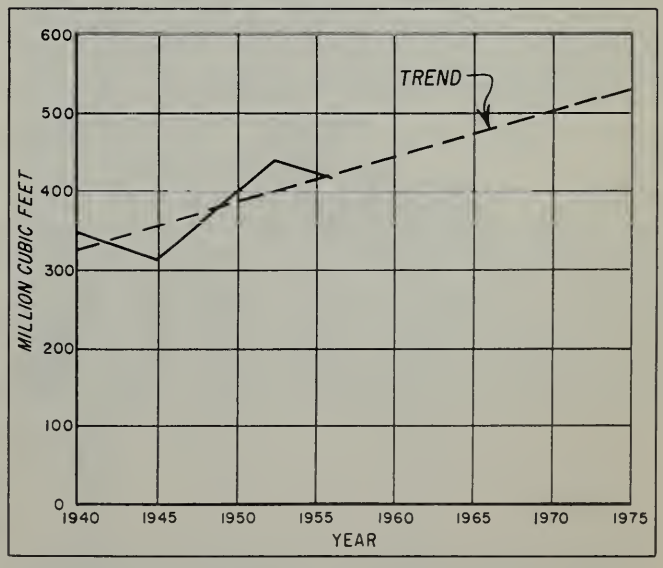


Figure 2.—Timber cut and trend, 1940 to 1975.

Outlook for Big Increase In Timber Demand

Further increases in the cut appear highly probable. If cutting follows the same trend in the future as it has during the past 17 years, Virginia will be cutting 525 million cubic feet by 1975, or 27 percent more than was cut in 1956 (fig. 2). In the light of the growing needs of America's rapidly increasing population, the cut could be even greater. In 1952, Virginia, with 2.9 percent of the commercial forest area in the Nation, contributed 4.0 percent of the cut. Maintaining this share of one recent estimate[1] of the probable national future cut would require a 34-percent increase in the cut by 1975 and a 94-percent increase by 2000.

More Timber Cut for Pulpwood; Less for Fuelwood

Lumber continues to be Virginia's most important timber product (fig. 3); sixty percent of the cut is used for saw logs (fig. 4). Lumber production has averaged 1.2 billion board-feet a year during the past 17 years. A high of 1.6 billion was reached in 1950, but for most years production has been between a billion and 1.2 billion board-feet (table 1).

Softwood lumber production shows no discernible trend, but the trend in hardwood lumber, although obscured by year-to-year fluctuations, is definitely upward. The computed trend over the past 17 years indicates that hardwood lumber production is increasing at the rate of 3.7 percent a year.

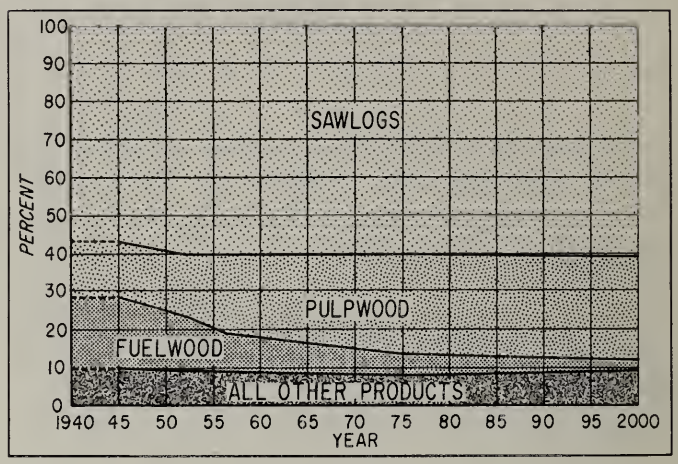


Figure 4.—Proportion of timber cut, by selected products, and projected proportion, 1975 and 2000.

Figure 3.—Saw logs cut for lumber continue to be the most important use of timber in Virginia.

[1] Middle projected demand for timber cut from live sawtimber, as shown in "Timber Resources for America's Future," U. S. Dept. Agr. Forest Resource Report No. 14, Washington, D. C., 1958.

Table 1.—Lumber production, selected years 1940 to 1956 1/
(In million board feet)

Year	Softwoods	Hardwoods	Total
1940	713	337	1,050
1941	731	312	1,043
1942	813	401	1,214
1943	662	436	1,098
1944	640	577	1,217
1945	548	447	995
1946	683	534	1,217
1947	740	426	1,166
1948	--	--	--
1949	652	381	1,033
1950	983	574	1,557
1951	815	613	1,428
1952	670	518	1,188
1953	642	498	1,140
1954	740	511	1,251
1955	662	593	1,255
1956	730	642	1,372

1/ Source: U. S. Bureau of the Census.

One of the biggest changes in the cut by product is the increase in pulpwood (fig. 5). Between 1945 and 1956, pulpwood production has doubled (table 2). In 1956 the 1.6 million cords of pulpwood accounted for 21 percent of the total cut, compared to the 0.8 million cords which accounted for 15 percent in 1945. In 1957, pulpwood production dropped to 1.4 million, but this reduction was probably a temporary sag in the long-term upward curve.

One important change in the pulpwood production picture in recent years has been the disappearance of dead chestnut. Prior to 1949, pulpwood production included about 50,000 cords of this material, which made up about a fifth of the hardwoods cut for pulpwood. After 1948, the use of dead chestnut dropped rapidly as the remaining supplies were depleted or became too defective to be used, and virtually no dead chestnut pulpwood has been reported since 1952.

Figure 5.—Pulpwood production has doubled since 1945, and in 1956 made up 21 percent of the timber cut, compared to 15 percent in 1945.

Another change is the increased use of plant residues for pulpwood (fig. 6). Although Virginia's pulp production coming from plant residues is still small, the amount has been increasing rapidly during the past 5 years. In 1956 it amounted to the equivalent of 27,000 cords of pulpwood, or 2 percent of the total production. About four-fifths of this material comes from slabs and edgings produced at sawmills. Other plant residue includes veneer cores, cull crossties, and the end-trims from poles and pilings.

Also, more and more of the pulpwood is being cut from poletimber and cull trees. In 1956, 37 percent of the pulpwood cut came from poletimber, compared to 40 percent from sawtimber. Twenty percent was produced from cull trees, sapling-sized trees, and portions of sound trees not included in the growing-stock volume.

Although the volume of pulpwood cut from hardwoods is increasing, the proportion has varied little from 20 percent during the past 10 years. In 1950 and 1951, the proportion cut from hardwoods hit a high of 24 percent; in 1949 it was down to 17 percent. But again in 1957, 24 percent of the pulpwood produced came from hardwoods.

Table 2.—Pulpwood production, 1945 to 1957
(In thousand cords)

Year	Pine	Hardwoods	Total
1945	606	193	799
1946	718	253	971
1947	776	249	1,025
1948	1,026	280	1,306
1949	705	190	895
1950	775	269	1,044
1951	989	337	1,326
1952	830	239	1,069
1953	1,033	234	1,267
1954	1,033	225	1,258
1955	1,138	268	1,406
1956	1,273	357	1,630
1957	1,080	338	1,418

Figure 6.—At an increasing number of the larger sawmills in Virginia, logs are debarked, the debarked slabs are chipped, and the chips are blown into a waiting van to be shipped to a pulpmill.

The increase in timber cut for pulpwood has just about matched the decline in the cut for fuelwood. The total volume of wood used for fuel is now half what it was in 1945. Also, more and more of the fuelwood is coming from plant residues, dead trees, and culls, and less and less from growing stock as the timber becomes more valuable for other products (fig. 7). In 1956, only 46 percent of the fuelwood used came from sound trees 5 inches or larger in diameter. Other sources included 28 percent from cull trees, sound saplings, limbs, and tops under 4 inches in diameter, 20 percent from plant residues, and 6 percent from dead trees.

The main reason for this drop in use of wood for fuel has been the shift to other fuels and electricity, especially in rural households. For example, the number of rural households using wood for cooking in Virginia dropped from 181,000 in 1940 to 108,000 in 1950. Similarly, the number of rural households using wood for heating has dropped from 170,000 to 99,000 in 10 years.

Figure 7.—Not only is less wood being used for fuel now than in 1945, but a larger proportion of fuelwood comes from sources other than growing stock, such as these end cuts from a nearby stave mill.

Another change affecting the use of wood for fuel has been the shift from wood to oil in curing tobacco. In 1945, 154,000 cords of wood were used to cure tobacco in Virginia; now much of the tobacco is cured by oil furnaces.

Percentagewise, the volume of timber cut for veneer logs and bolts has increased substantially, but the amount currently being cut is still only 3 percent of the total cut. The amount of timber used for poles and piling, cooperage, hewn ties, fence posts, and timbers has dropped sharply, but these products have never made up a very large proportion of the cut.

These changes in use by product have had very little effect on the kind of timber forest industries need by species, size, or quality. If anything, forest industries are somewhat more exacting in their requirements than formerly. The increase in pulpwood cut puts a heavier drain on yellow pine than the fuelwood production it has replaced. Although small timber can and is being used for pulpwood, the need for large, high-quality timber, both softwoods and hardwoods, has not diminished (fig. 8). The cut for saw logs is as great as formerly, and the cut for veneer logs has increased. More large, high-quality timber would undoubtedly be cut if more of it were available. Past trends and studies of the kind of wood most needed in the future all indicate that for many years to come the demand will be for much the same kind of timber as that now being used, but in substantially larger quantities. A continuation of the upward trend in timber cut during the past 17 years would mean a cut of 525 million cubic feet by 1975, 27 percent greater than the 1956 cut.

Figure 8.—No important shift in the kind of timber needed in the future is seen at this time. For many years to come, at least 60 percent of the timber Virginia grows will have to be large enough and of high enough quality to produce good lumber.

TRENDS IN THE TIMBER SUPPLY

For the most part, Virginia's timber supply is adequate to meet the immediate need for timber. Except for large pine sawtimber (trees 15.0 inches d.b.h. and larger), current growth is at least replacing the annual cut. However, in view of the prospective increase in the demand for pine and the strong natural tendency for hardwoods to replace pine throughout large areas in Virginia, the long-term outlook is not nearly so favorable.

Figure 9.—Land abandonment and reversion to forest exceeded land clearing by 1.3 million acres during the 17-year period between surveys.

More Land to Grow Timber

One trend favorable to the long-term outlook is the increase in land available to grow timber (fig. 9). During the 17-year period between forest surveys, forest area in Virginia increased from 14.8 million acres in 1940 to 16.1 million acres in 1957, an increase of 8.6 percent. Forests now cover 63 percent of the land area in the State, compared to 58 percent in 1940 (fig. 10).

Practically all Virginia's forest area is suitable and available for timber production. Only 663,600 acres, or 4 percent, is classed as noncommercial. Most of this area consists of extremely poor and inaccessible sites in the mountains. The remaining noncommercial area, most of it in the Shenandoah National Park, is productive but withdrawn from timber production for recreational purposes.

Forest area increased in all parts of the State, but the biggest increases occurred in the southern mountains and in the southern Piedmont. In the southern mountain unit, commercial forest land increased 15 percent, and in the southern Piedmont, 10 percent (table 3). About two-thirds of the total increase took place in these two units. Forest area in the coastal plain and northern Piedmont increased by only 4 percent, and in the northern mountains, by 6 percent.

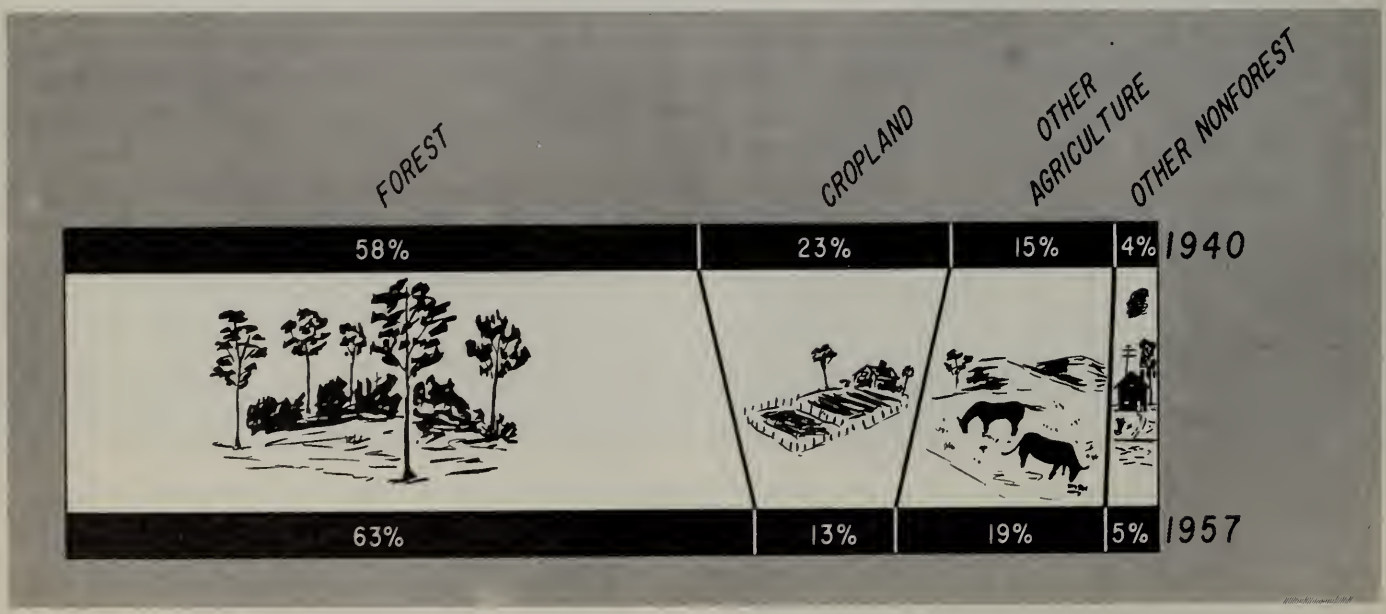


Figure 10.—Percent of land area by class of land use, 1940 and 1957.

Forests make up more than half the total area in each section of the State (fig. 11). Even the least forested units have 59 percent in forests. The southern Piedmont, which is the most heavily forested, is 66 percent forest.

Nearly all the increase in forest area is former agricultural land that has been abandoned and allowed to revert to forest. During the 17-year period between forest surveys the area of cropland dropped from 6.0 million to 3.2 million acres.

Further increases in forest land can be expected as the trend toward abandoning the less productive land and cropping more intensively the most productive land continues. Other cleared land, including pasture and idle cropland, amounts to 5.0 million acres, 1.2 million acres more than in 1940. A large share of the idle cropland is available for timber production.

Forces are at work, however, which may slow down the rate of increase in forest land. As the population increases, more and more land will be devoted to urban developments, highways, public utilities, and water storage facilities (fig. 12). The area of land devoted to these uses is still small, less than a million acres in 1957, but it has almost doubled in the last 17 years. Even with these opposing trends, the chances are good that Virginia will have 1 to 2 million acres of additional land for growing timber in the next 25 years.

Pine Losing Ground

This favorable trend in area of forest land is offset in part by the unfavorable trend in area growing pine. Because pine characteristically invades abandoned fields, it is reasonable to assume that a large share of the million-acre increase in forest area between surveys became stocked with pine. Yet this increase in pine type was more than offset by the conversion of existing pine and oak-pine types to hardwoods (fig. 13). During the 17-year period between surveys the area of pine and oak-pine types dropped 342,500 acres, an average of about 20,000 acres a year (table 3).

This decline in area of pine type was balanced to some extent by improvement in pine stocking on the area that remained pine type. In 1940, there were enough pine trees 1.0 inch and larger in Virginia to stock 59 percent of the pine and oak-pine area; by 1957 the number of pine trees, though 4 percent less, was sufficient to stock 62 percent of the pine and oak-pine area (table 4). However, the number of newly established pine seedlings has failed to replace the number of 2- and 4-inch saplings growing into larger size classes. The number of 2-inch saplings dropped 8.2 percent and the number of 4-inch seedlings dropped 3.2 percent. This deficit will eventually be reflected in lower pine

Table 3.—Change in area of pine and hardwood types between surveys
(In thousand acres)

Unit	Pine types			Hardwood types			Total commercial forest area		
	1940	1957	Change	1940	1957	Change	1940	1957	Change
Coastal Plain	2,414.3	2,229.6	-184.7	1,504.9	1,837.5	+332.6	3,919.2	4,067.1	+147.9
Piedmont	2,757.0	2,711.1	-45.9	3,070.9	3,528.7	+457.8	5,827.9	6,239.8	+411.9
Northern Unit	908.0	934.4	+26.4	1,497.9	1,558.1	+60.2	2,405.9	2,492.5	+86.6
Southern Unit	1,849.0	1,776.7	-72.3	1,573.0	1,970.6	+397.6	3,422.0	3,747.3	+325.3
Mountains	1,059.1	947.2	-111.9	3,605.8	4,195.8	+590.0	4,664.9	5,143.0	+478.1
Northern Unit	612.8	597.2	-15.6	1,659.9	1,800.8	+140.9	2,272.7	2,398.0	+125.3
Southern Unit	446.3	350.0	-96.3	1,945.9	2,395.0	+449.1	2,392.2	2,745.0	+352.8
State	6,230.4	5,887.9	-342.5	8,181.6	9,562.0	+1,380.4	14,412.0	15,449.9	+1,037.9

Figure 11.—Forests dominate the landscape in all parts of Virginia. Even in the least forested areas, the northern Piedmont and southern mountains, forests make up 59 percent of the area.

Figure 12.—Area devoted to highways, public utilities, rights-of-way, and water storage, though still relatively small, can be expected to make increasingly greater inroads on the area available for timber production.

Figure 13.—Many pine and oak-pine stands consist principally of low-quality hardwoods following logging. Area of hardwood type increased by 1.4 million acres between surveys.

Table 4.—Comparison of number of sound trees, 1940 and 1957

D.b.h. class	Yellow pines				Hardwoods			
	1940	1957	Change		1940	1957	Change	
	Thousand trees			Percent	Thousand trees			Percent
2	884,433	812,276	-72,157	-8.2	2,680,542	2,984,749	+304,207	+11.3
4	456,774	441,992	-14,782	-3.2	656,795	1,007,452	+350,657	+53.4
6	279,246	285,680	+6,434	+2.3	310,531	412,104	+101,573	+32.7
8	149,967	156,130	+6,163	+4.1	160,958	238,346	+77,388	+48.1
10	75,536	71,922	-3,614	-4.8	99,030	143,367	+44,337	+44.8
12	37,924	37,023	-901	-2.4	61,825	83,570	+21,745	+35.2
14	17,306	16,334	-972	-5.6	35,023	51,742	+16,719	+47.7
16	7,513	6,346	-1,167	-15.5	17,357	25,369	+8,012	+46.2
18	3,151	2,658	-493	-15.6	10,444	14,033	+3,589	+34.4
20+	2,395	1,868	-527	-22.0	14,525	14,196	-329	-2.3
Total	1,914,245	1,832,229	-82,016	-4.3	4,047,030	4,974,928	+927,898	+22.9

stocking and reduced pine growth unless offset by planting or other measures to encourage pine regeneration.

Not only does Virginia have less land growing pine now than in 1940, but it has less pine volume (table 5). The biggest change was the 20-percent drop in volume of large pine sawtimber, trees 15.0 inches and larger in diameter at breast-height. An increase of 4 percent in pine poletimber volume (trees 5 inches through 8 inches) was just about offset by a 4-percent decrease in the volume of small sawtimber (trees 9.0 through 14.0 inches). Because large sawtimber contains only 13 percent of the total pine volume, this large decrease resulted in only a 4-percent decrease in the total volume in trees 5.0 inches and larger (table 6).

In 1956, total pine growth was slightly in excess of cut. Large pine sawtimber was still being overcut but not so severely as in the past. Thus, unless action is taken to increase pine growth, even a moderate increase in cut would result in a continuation of the downward trend in pine volume.

Hardwoods Overrun Forest Area

In sharp contrast to the pines, which are barely holding their own, hardwoods are increasing very rapidly. Between surveys the area of hardwood types increased by 1.4 million acres. Hardwood types now make up 62 percent of the forest area, compared to 57 percent in 1940. The number of hardwood trees increased by 23 percent. Only the number of trees 20.0 inches and larger decreased, and by only 2 percent. Hardwood sawtimber volume increased by 29 percent and total hardwood volume by 38 percent.

Not all of this increase in hardwood volume, of course, is undesirable; Virginia's forest industries need hardwoods as well as pine. As shown in an earlier section, about half the timber cut in Virginia is hardwoods. Despite substantially increased use, the State has a surplus of hardwoods at present. The current cut is only 42 percent of total growth, including culls. Even for the preferred species, which include yellow-poplar, sweetgum, and

Table 5.—Comparison of sawtimber volumes, 1940-1957 1/

Species group	1940	1957	Change	
	Million bd.-ft.	Million bd.-ft.	Million bd.-ft.	Percent
Yellow pines	11,882	10,834	-1,048	-9
Other softwoods	1,074	1,242	+168	+16
Soft hardwoods	5,972	7,333	+1,361	+23
Hard hardwoods	11,484	15,106	+3,622	+32
All species	30,412	34,515	+4,103	+13

1/ Original survey volumes have been recomputed to eliminate differences resulting from changes in standards between the two surveys. Thus, the 1940 estimate shown here will not agree with volumes previously published.

Table 6.—Comparison of volumes in all trees 5.0 inches d.b.h. or larger, 1940-1957 1/

Class of material and species group	1940	1957	Change	
	Million cu. ft.	Million cu. ft.	Million cu. ft.	Percent
Growing stock:				
Yellow pines	3,994	3,839	-155	-4
Other softwoods	255	304	+49	+19
Soft hardwoods	1,933	2,526	+593	+31
Hard hardwoods	4,255	5,797	+1,542	+36
All species	10,437	12,466	+2,029	+19
All live trees:				
Softwoods	4,459	4,519	+60	+1
Hardwoods	7,607	10,509	+2,902	+38
All live trees	12,066	15,028	+2,962	+25

1/ Original survey volumes have been recomputed to eliminate differences resulting from changes in standards between the two surveys. Thus, the 1940 estimate shown here will not agree with volumes previously published.

white and northern red oak, growth is one-and-a-half times the cut.

Although hardwoods are growing much faster than they are being cut, nearly all of the hardwood volume in Virginia is potentially usable, at least for fibre. The preferred hardwood growing stock makes up 35 percent of the total hardwood volume, other hardwood growing stock 46 percent, and hardwood culls 19 percent. Other hardwood growing stock consists mainly of less desirable oaks (such as chestnut, post, scarlet, black, and southern red oaks) and hickory.

Hardwood growing stock includes the volume of sawtimber trees (those now 11.0 inches d.b.h. or larger with at least 50 percent of their volume suitable for lumber) and poletimber trees (those 5.0 to 11.0 inches which are expected to qualify as sawtimber when they become large enough). Most of the cull hardwoods are culls only in the sense that they do not meet the minimum specifications for sawtimber. Nearly all these trees are sound culls — disqualified as growing stock because of undesirable species, poor form, excessive limbiness, or other defects. For the most part, they are just as suitable for pulpwood as the hardwood growing stock. Less than 10 percent of the hardwood cull volume is in rotten cull — trees having little use except for fuelwood.

This big surplus of timber would be desirable if it were not for the fact that the hardwoods are increasing so rapidly that they threaten to take over forest land needed to grow pine. In 1940, hardwood trees 1.0 inch or larger, including culls, covered 48 percent of the forest area; by 1957, this kind of timber covered 58 percent. And if hardwoods are allowed to continue increasing at this rate, they will cover 82 percent of the area by 1982.

Exclusive of possible additions to the forest area from abandoned cropland, this would leave 18 percent of the area, or only 2.8 million acres, to grow pine. This area, which is 3.1 million acres less than the 5.9 million acres now in pine and oak-pine type, even if fully stocked, would not be sufficient to grow enough timber to maintain the present cut.

Poor Balance Between Supply and Cut

While Virginia has enough forest land to grow substantially more than the present cut, far too much of the land is growing timber the forest industries cannot use now or in the foreseeable future. In 1956, 45 percent of the total timber cut came from softwood growing stock, yet this kind of timber made up only 28 percent of the inventory volume and only 18 percent of the total crown cover. In sharp contrast, other hardwood growing stock and hardwood cull timber are in surplus supply. They make up only a third of the cut, but culls and other hardwoods account for nearly half of the inventory volume and nearly two-thirds of the crown cover.

The supply of preferred hardwood growing stock seems to be in fairly good balance with the cut; with 24 percent of inventory volume and 19 percent of the crown cover, this kind of timber makes up 23 percent of the cut.

With no change in the present cut by type of timber, the trend is toward a still poorer balance between the cut and supply. Twenty-five years from now, softwood would make up only 22 percent of the inventory; culls and the other hardwoods would make up over 50 percent (fig. 14). An increase in the cut of softwoods and better hardwoods, which seems highly likely, would aggravate this condition.

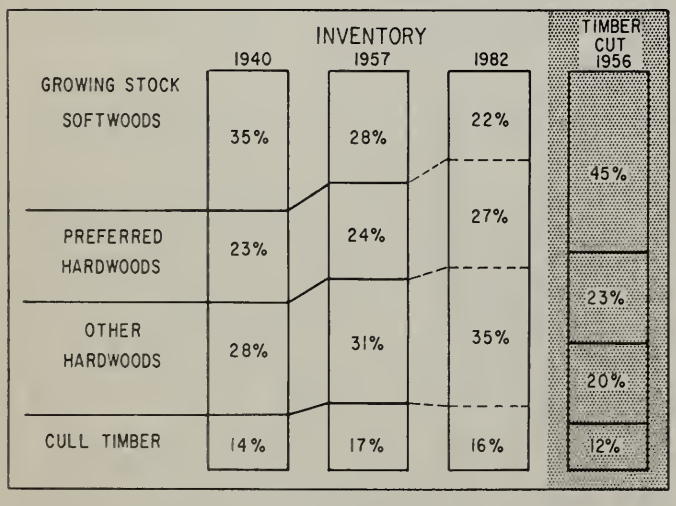


Figure 14.—Inventory volume in relation to current annual cut. Pine now makes up 45 percent of the cut, but if present trends continue, pine will comprise only 22 percent of standing timber in 1982.

Current Growth Far Below Capacity

In 1956, Virginia had enough trees 1.0 inch or larger to stock two-thirds of the forest area, but only enough pine trees to stock 24 percent of the forest area. The average timber stand contains 2,279 board-feet of sawtimber or 11.3 cords of growing stock per acre (table 7). Net growth on this timber averages 105 board-feet or a half cord per acre per year. Fully stocked forest land in Virginia should be able to grow on the average at least 160 board-feet or ¾ cord per acre per year — a 50-percent increase over current growth.

This potential growth is an average for all stand sizes. Annual growth for stands about to be harvested, of course, will usually be two or three times greater, but a considerable part of the forest land must be devoted to restocking with seedlings and saplings which do not contribute to the volume growth.

The growth per acre may be further increased by improving forest management. Frequent thinnings and improvement cuts will increase substantially the total yield per acre. Removing the less vigorous, the most defective, and the shortest-boled trees from the stand will mean faster growth, less mortality, and more volume per tree in the remaining stand.

Under the most favorable conditions, i.e., intensive forest management, full stocking with high quality growing stock and a 1- to 2-million-acre increase in forest area, Virginia probably could increase current growth by as much as 75 percent.

The present cut of softwoods and hardwoods is well within Virginia's timber-growing capacity. However, increasing growth even enough to maintain the current trend in the cut will require both a substantial increase in growing stock and a major adjustment in the proportion by species group. For example, increasing pine growth by one-third would require increasing the area of pine type from the present 5.9 to 6.2 million acres and bringing the average stocking up from the present 62 percent to about 80 percent.

Table 7.—Net volume and growth per acre by forest type and survey unit, 1957

Survey unit and forest type	Sawtimber		Growing stock	
	Inventory	Growth	Inventory	Growth
	Board-feet		Cords	
State:				
Yellow pine	2,363	149	12.6	0.77
White pine	5,068	147	14.7	.60
Oak-pine	1,986	101	10.5	.51
Oak-hickory 1/	2,095	81	10.3	.39
Oak-gum-cypress	3,665	121	15.1	.53
All types	2,279	105	11.3	.51
Coastal plain:				
Yellow pine	3,947	274	17.3	1.11
White pine	--	--	--	--
Oak-pine	3,182	163	13.5	.66
Oak-hickory 1/	3,200	136	13.4	.51
Oak-gum-cypress	4,493	157	17.6	.65
All types	3,713	204	15.8	.82
Piedmont:				
Yellow pine	1,317	66	10.2	.62
White pine	--	--	--	--
Oak-pine	1,632	81	9.9	.45
Oak-hickory 1/	2,028	75	10.6	.36
Oak-gum-cypress	2,612	82	12.0	.42
All types	1,801	74	10.5	.45
Mountains:				
Yellow pine	941	39	5.9	.28
White pine	5,442	143	16.4	.59
Oak-pine	849	45	7.1	.41
Oak-hickory 1/	1,822	69	9.2	.37
Oak-gum-cypress	--	--	--	--
All types	1,726	65	8.8	.37

1/ Includes volume in maple-beech-birch type.

INCREASING THE TIMBER SUPPLY

Since the first Survey was completed in 1940, a good deal of forestry progress has been made in Virginia. A law now in effect requires that an adequate seed source be left following cutting (fig. 15). Virginia's good record of forest area burned is the result of its vigorous fire protection organization and the "Keep Virginia Green" program. Planting has increased rapidly under the "Plant More Trees" program, and each year unwanted hardwoods are destroyed on thousands of acres. The State has an effective plan and organization to deal with forest insects and diseases.

As a result of these efforts, the scales have been tipped slightly in favor of the pines. As long as the demand for pine is no greater than it is now, little more than a continuation of present trends in forestry will be needed to grow enough timber. However, present forestry action falls far short of providing enough timber to meet the expected increase in demand.

Figure 15.—Leaving an adequate seed source following cutting will go a long way toward assuring future supplies of pine timber.

Big Planting Job Ahead

To supply this increased demand, millions of additional pine seedlings must be established annually. Natural regeneration alone cannot be counted on to provide the seedlings needed.

As hardwoods continue to take over large areas formerly stocked with pine, planting will be relied upon more and more to supplement natural regeneration. Since 1945, planting has increased sharply (fig. 16). In 1945, only 836 acres were planted; by 1950, the area planted had jumped to 5,474 acres, and during the 1956-57 planting season enough pine trees were planted to stock 36,000 acres (table 8). On the average, 65 to 70 percent of the seedlings planted survive the first growing season. If the surviving seedlings are reasonably well spaced, survival rates even below this average will still result in satisfactory stocking by the time the stand reaches merchantable size.

In spite of this big increase in planting, the planting job is just started. In 1952, the total area that could be planted without site preparation was estimated to be 1.8 million acres. Between 1952 and 1957, about 100,000 acres were planted, leaving 1.7 million acres still suitable for planting. Most of this area (1.4 million acres) is idle agricultural land (fig. 17); the remainder is poorly stocked forest land. Cutting is not expected to add much to the plantable area, since most of the recently cut land either has an adequate seed source or will require site preparation.

If this area is to contribute materially to timber supplies by year 2000, reforestation should be completed by about 1980. To accomplish this will require planting about 75,000 acres annually, or a little more than twice the area planted during the peak season of 1956-57.

Figure 16.—During the 1956-57 planting season Virginia's forest nurseries supplied landowners with 33 million seedlings. Even this record production may still be too low to provide for the volume of timber needed 40 to 50 years from now. (Virginia Division of Forestry photo.)

Table 8.—Area planted, 1945 to 1957
(In acres)

Planting season	Area planted	Cumulative total
1944-45	836	17,988
1945-46	1,046	19,034
1946-47	1,723	20,757
1947-48	2,554	23,311
1948-49	3,798	27,109
1949-50	5,474	32,583
1950-51	4,927	37,510
1951-52	7,688	45,198
1952-53	10,050	55,248
1953-54	13,910	69,158
1954-55	16,199	85,357
1955-56	20,382	105,739
1956-57	36,161	141,900

Figure 17.—Virginia has 1.4 million acres of idle agricultural land. Unless planted, much of it will remain poorly stocked for many years, or become stocked with low-quality trees.

Large-Scale Hardwood Control Needed

Planting alone will not do the job. Vigorous action must be taken to maintain pine in the present pine and oak-pine types. Currently, the encroaching hardwoods are taking over 120,000 acres a year. Only 30,000 acres of this annual increase in hardwood cover consists of the preferred hardwood species. Culls take over 25,000 acres a year, and other less desirable hardwoods 67,000 acres. Not all, but a large part, of this increase is at the expense of pine. Just to maintain the present level of pine growing stock may require controlling enough hardwoods annually to make room for 50,000 to 75,000 acres of pine.

These hardwood control measures, of course, will not mean sacrificing desirable hardwood timber for pine. Most of the hardwoods that will be destroyed are very low in quality and contribute little or nothing to the present or future cut. The few high-quality hardwoods encountered during these control operations probably could be marketed. Also, such measures would not reduce the hardwood cover for game. In fact, killing enough hardwoods to make room for the pine needed to meet the medium level of projected demand would leave about the present area occupied by hardwoods.

Where the pine seed source is adequate, hardwood control will consist merely of destroying the undesirable cover and allowing the area to seed in naturally. Virginia has 1.4 million acres of oak-pine stands in which pine makes up only 25 to 50 percent of the volume. On most of this area, pine stocking will continue to decline unless measures are taken to remove competing hardwoods.

Other areas do not have an adequate seed source, and removal of the undesirable cover will have to be followed by planting. Virginia has 3.0 million acres of hardwood type which is probably more suited to growing pine than hardwoods. This area includes the oak-hickory stands on poor and fair sites in the coastal plain and Piedmont. Practically all of this area grew pine at one time, but now, because of cutting and natural ecological succession, it is covered mainly with small, low-quality trees of the less desirable hardwood species. Growth of hardwoods on these sites is low, merchantable boles short, and the occurrence of cull and defect high. Virginia has plenty of forest land far better suited to growing hardwoods than this area.

Clearly then, the so-called plantable area represents only part of the planting to be done in Virginia, possibly the smaller part. Planting following hardwood control and site preparation may add an additional 60,000 acres annually, running the total planting job to about 100,000 acres a year (fig. 18).

Figure 18.—On some areas where pine seed source is adequate (A) elimination of the competing hardwood and shrub cover will result in a satisfactory stand. But on many other areas (B) site preparation must be followed by planting.

Reducing Losses from Destructive Agents Will Help

Although most of the increase in growth will result from planting and hardwood control, reducing losses from destructive agents is an important means of increasing net growth. Merchantable timber saved from fire, insects, and disease is immediately available to forest industries, but it takes several decades for planting and hardwood control to be reflected in growth of merchantable timber.

Each year destructive agents kill 88 million cubic feet of growing stock. This represents about 16 percent of the current net growth. However, since only a third of this mortality is pine, the opportunity to make more pine available by reducing mortality is limited. A reduction of a third, which is considered reasonable expectation, would make 10 million cubic feet immediately available to forest industries. This is equivalent to the growth on 200,000 acres of forest land.

Mortality, or the volume of trees 5.0 inches and larger killed or destroyed, makes up only a small part of the total loss caused by destructive agents. The total effect on growth, the growth impact, which includes mortality and growth losses, has been estimated to be as much as six times the mortality. Losses other than mortality arise from growth slow-down due to changes in timber type, to defoliation, and to reduced tree vigor. Other causes include delays in restocking, deficiencies in stocking, increase in cull, and loss of accumulated growth that would have been added if small trees had not been destroyed. These losses may add up to as much as three-fourths of the total growth. Cutting these losses by a third could add as much as 60 million cubic feet to net annual growth of pine. Fire, insects, and disease account for nearly two-thirds of the mortality and growth loss. The remaining damage is from miscellaneous causes such as wind, drought, animals, and suppression.

Decreasing the destructive action of fire, insects, and disease would increase the number of seedlings getting started, but the effect of this increased stocking would not be felt for 40 or 50 years. More important is the action that will reduce the destructive effect of fire and forest pests on trees large enough to contribute to the timber supply now.

Excellent Forest Fire Record

Virginia has one of the best forest fire records in the Southeast. In 1956, fires burned over only 10,000 acres, or only 0.07 of the forest area.

However, 1956 was an unusually good year. During the past 10 years, the average annual burn was about 28,000 acres (table 9). Each year about 1,900 fires start and burn on the average 15 acres of forest land. Still, during the past 10 years, less than 0.2 percent of the forest area in Virginia burned over annually.

All of Virginia's forest land is protected from fire, and protection is in general adequate, except that failure is likely in the worst fire years. Very little of the forest land has fire protection adequate to meet the worst fire situations that can be expected to occur from time to time. Yet it is highly important that provision be made to handle such emergencies, since one bad year can wipe out all the gains made during the good and average years (fig. 19). For example, the area burned during the exceptionally dry year of 1952 was equal to almost half the total area burned during the period 1947 through 1956.

Insects and Disease

Insects and disease affect the timber supply in a number of ways. Trees killed mean a loss of timber volume and a reduction in stocking. But most important is the reduction in vigor and value of surviving trees. Complete or partial defoliation, such as occurred following recent outbreaks of hardwood defoliators and pine sawflies, reduces growth on millions of trees and invites attacks by secondary insects, causing degrade and deterioration. An even more serious loss arises from the deterioration, degrade, and loss of usable volume caused by rot, especially heart rot. It is estimated that heart rot alone accounts for four-fifths of the total growth loss due to disease in the South. In Virginia, where a large proportion of the hardwoods are of sprout origin or have at one time or another been scarred by fire, the losses may be even greater. The reduction in area burned in Virginia will go a long way toward reducing this serious source of timber loss. Also, the reversing of a common logging practice on unmanaged land — cutting the best and

Table 9.—Area burned, number of fires, percent of forest area burned, and average size of fires, 1947 to 1956

Year	Area burned	Percent of forest area	Number of fires	Average size of fires
	Acres			Acres
1947	25,100	0.17	1,701	15
1948	8,185	0.06	1,028	8
1949	12,597	0.09	1,630	8
1950	20,740	0.14	2,110	10
1951	16,228	0.11	1,994	8
1952	118,690	0.81	2,568	46
1953	35,197	0.24	2,517	14
1954	17,407	0.12	2,393	7
1955	17,648	0.12	1,564	11
1956	10,244	0.07	1,461	7
Average	28,204	0.19	1,897	15

Figure 19.—Favorable weather conditions, together with efficient protection and control measures, have reduced area burned to a record low. However, fire protection must be geared to cope with the worst fire conditions, since one bad year can quickly wipe out gains made during many good years. (Virginia Division of Forestry photo.)

leaving the poorest — would decidedly reduce losses from disease and other defects in Virginia.

Because of the widespread and sporadic occurrence of such losses, their reduction presents a very difficult problem. Where concentrations of damaged timber are heavy enough to justify logging operations, prompt salvage can be undertaken. But such concentrations are the exception rather than the rule. Some of these losses can be reduced by eliminating damaged trees during harvest or improvement cuts and by encouraging timber which is less susceptible to damage. But such efforts can never eliminate all the losses from insects and disease; a certain amount must be accepted as natural and irreducible.

A constant vigil to detect threatening flareups of epidemic proportions, and the ability to bring such flareups quickly under control is as important as minimizing natural losses. Virginia has come a long way toward establishing an effective pest detection and control organization. A blister rust control program has helped keep disease losses to white pine low, and an aggressive State oak wilt control program shows promise of preventing major damage from this disease. A reporting system is in effect whereby individual landowners report signs of outbreaks to the State's pest control officer. Both State and Federal agencies make surveys of such outbreaks and issue reports, newsletters, and bulletins to inform landowners of serious outbreaks. Where the damage is serious enough to justify control measures, they recommend the most effective method available. In addition, meetings are held to train landowners in detecting outbreaks.

One-Third of Timber Cut Is Not Used

A large proportion of the timber classed as growing stock cut each year is not used. About 10 percent is left in the woods following logging, while another 21 percent ends up as unused plant residue, mainly as slabs, edgings, and sawdust (table 10). Thus, only two-thirds of the timber cut is actually used.

The use of a large part of this material is not practical, nor would its use contribute to easing the timber supply situation. In the first place, almost two-thirds of this unused material is hardwoods. Most of the hardwood timber left in the woods is in tops, material which at best is suitable only for pulpwood, and much of it only for fuelwood. Virginia has a big surplus of this kind of timber; a greater use of either the logging residue or plant residue would not help fill the demand for pine or high-quality hardwood timber.

Furthermore, complete use of material left following pine logging operations would not materially increase the supply of pine. Only 6 percent of the pine timber is left following logging, and most of this consists of widely scattered and extremely limby tops too poor in quality to justify salvage.

A greater use of pine slabs and edgings

Table 10.—Disposition of timber cut by species group, 1956

Disposition	Softwoods		Hardwoods		Total	
	Thousand cu. ft.	Percent	Thousand cu. ft.	Percent	Thousand cu. ft.	Percent
Left in woods (logging residue)	11,836	5.6	31,178	15.6	43,014	10.4
Transported to mill:	200,064	94.4	169,122	84.4	369,186	89.6
Used in manufacture	139,501	65.8	91,346	45.6	230,847	56.0
Plant residue	60,563	28.6	77,776	38.8	138,339	33.6
Used	22,005	10.4	26,510	13.2	48,515	11.8
Coarse	9,155	4.3	10,579	5.3	19,734	4.8
Fine	12,850	6.1	15,931	7.9	28,781	7.0
Unused	38,558	18.2	51,266	25.6	89,824	21.8
Coarse	19,380	9.1	27,488	13.7	46,868	11.4
Fine	19,178	9.1	23,778	11.9	42,956	10.4
Total timber cut	211,900	100.0	200,300	100.0	412,200	100.0

offers the most promising opportunity to make the timber supply go farther. During 1956, the volume of edgings and slabs produced from the manufacture of 626 million board-feet of pine lumber was equivalent to 357,000 cords. About 25 percent of this was used for pulpwood; another 25 percent was burned for fuel. The remainder was not used.

While only a small part of this available material is being used for pulpwood, the upward trend is encouraging. In 1956, about 20,000 cords of pulpwood were produced from slabs and edgings. Because much of the lumber is sawn at many small mills scattered throughout the countryside, complete use of this material will probably never be practical. Few of these small mills can afford log debarking equipment. Even where central edging and slab debarking equipment can be set up, the collection and transportation present a difficult problem. However, the utilization of but half this material for pulpwood would increase the supply of pine timber available to pulpmills by 178,000 cords. This would have the same effect as increasing net growth by about 5 percent.

Figure 20.—The amount and kind of timber Virginia will be able to supply forest industries in the future depends mainly on what the more than 200,000 owners do now to improve their small woodland tracts. (Virginia Division of Forestry photo.)

Future in Hands of Owners of Small Woodlands

Although there are many things forest industry, public agencies, and conservation-minded groups can do to encourage efforts to increase Virginia's timber supply, the main responsibility remains with the landowner. Virginia's forest industries depend upon the timber on thousands of small individual tracts scattered throughout the State for the major portion of their timber supply.

Public agencies own only 1.5 million acres of forest land, of which 1.2 million acres is in national forests. Forest industries own an additional 1.2 million acres. These two classes of lands receive the best forest management. According to a recent study, 90 percent of the recently-cut public land and 80 percent of recently-cut industrial land was left in satisfactorily productive condition.

But public and industrial lands account for only 18 percent of the forest area. Furthermore, the national forest land, which consists mainly of the less productive hardwood types, can supply little of the pine timber most in demand.

By far the greatest share of the cut will continue to come from the 12.7 million acres of forest land in small tracts owned by over 200,000 individuals. The average owner in this group has about 60 acres of forest land, and he is not dependent upon his forest land for livelihood. Two-thirds of these owners are farmers. Income from their woodland, partly as a result of the way it is managed, is usually sporadic and uncertain. Under such conditions, they have little incentive to expend money and effort to raise the productivity. Yet the amount and kind of timber that will be available to forest industries in the future depend largely upon what these owners do, or fail to do, to improve their woodlands (fig. 20).

APPENDIX

Accuracy of Forest Survey Estimates

In general, the errors affecting accuracy of Forest Survey area and timber volume estimates arise from two sources. These may be described as (1) sampling errors which result from using sampling procedures rather than making a complete inventory or canvass, and (2) nonsampling errors which arise from human mistakes in judgment, measurement, and recording.

In Forest Survey work a diligent effort is made to maintain a high degree of accuracy in the collection and compilation of data. The sampling errors are held to a specified minimum through survey design and sampling technique. These errors are the only measurable errors involved in computing the reliability of the data. The nonsampling errors are minimized or eliminated through training, supervision, field check cruises, and complete editing and machine verification in compiling the data.

Preliminary estimates of area by land-use class were based on examination of about 182,700 points systematically spaced on aerial photographs for the State. Subsamples of 4,822 photo points classified as forest and 1,737 in other land uses were established as sample plots on the ground. These ground plots provided adjustments for changes in land use since the date of photographs, and supplied detailed measurements and observations needed in evaluating forest conditions.

Forest area.--The sampling intensity of the 1957 survey provided an estimate of the total forest area with a standard error of plus or minus 0.4 percent. The probabilities were two out of three that the actual forest area was within plus or minus 0.4 percent of the estimated acreage. The standard error per million acres was plus or minus 1.6 percent.

Cubic volume.--The standard error of the net cubic-foot volume estimate was plus or minus 1.5 percent, or plus or minus 5.3 percent per billion cubic feet. Here again, the probabilities were two out of three that the actual volume did not vary from the estimated volume by more than these percentages. The error of the volume in cords was not computed, but it should have been approximately the same as for cubic volume.

Board-foot volume.--The standard error of the total board-foot volume estimate was plus or minus 1.9 percent.

Growth.--Estimates of timber growth were based on measurements of radial growth on 9,480 sample trees, and on mortality data taken on sample plots. Because of technical problems involved, no attempt was made to compute the sampling error of growth estimates.

Timber cut.--Estimates of the amount of timber cut were based on the number, size, and species of stumps tallied on cutover plots. Stumps of all trees cut during the 3-year period preceding the date of inventory were included, and the measurements were converted into tree volume. The average volume of timber cut for the 3-year period was taken as the annual estimate. The standard error for the total volume of growing stock cut was plus or minus 5.3 percent, or plus or minus 3.4 percent per billion cubic feet.

Use of county data.--The tables showing forest area, timber volumes, and timber cut by county are included to permit grouping of the data in any desired area combinations. In designing the survey, provision was made for controlling the range of sampling error on a county basis. However, comparison or use of individual county statistics should be avoided because of the possibility that they may be subject to considerable error. It is recommended that area or volume data for a minimum of five counties be combined, and that at least 10 counties be used when working with data on timber cut.

The actual range of errors in county data is as follows:

Item	Percent of error	
	Low	High
Forest area	±0.8	±6.6
Growing stock volume	±8.0	±18.4
Board-foot volume	±8.9	±24.7

Definition of Terms

Land-Use Classes

Forest land: Includes (a) lands which are at least 10 percent stocked with trees of any size and capable of producing sawtimber or other wood products, and (b) lands from which the trees described in (a) have been removed to less than 10-percent stocking but which have not been developed for other use; subdivided into the following classes:

> Commercial: Forest land which is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or in the future, and (c) not withdrawn from timber use.
>
> Noncommercial: Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Nonforest land: Includes land under cultivation or in pasture where the timber has been cleared to less than 10 percent stocking, idle or abandoned agricultural land, marsh land, and land in urban, residential, or industrial areas, school yards, cemeteries, roads, railroads, and other rights-of-way.

Water: Includes lakes, bays, and estuaries over 40 acres in size, and streams, canals, and sloughs at least one-eighth of a mile in width which are classed as "inland water" by the Bureau of the Census. Smaller lakes and ponds between one acre and 40 acres in size, and waterways between 120 feet and 660 feet in width, which are classed as land area by the Bureau of the Census, are also included as water areas.

Forest Types

Forest type is determined on the basis of cubic volume for all stand sizes except seedlings and saplings (stand size 4), in which case the number of stems is the criterion.

Yellow pine types: Forests in which 50 percent or more of the cubic volume or number of stems in the stand is loblolly, pond, shortleaf, or Virginia pine. In mixtures the predominating species determines the type.

White pine-hemlock type: Forests in which 50 percent or more of the cubic volume or number of stems in the stand is white pine or hemlock.

Hardwood-pine type: Forests in which 50 percent or more of the stand is in hardwoods, but in which southern yellow pine species make up 25 to 49 percent of the stand.

Oak-hickory type: Upland hardwood forests in which 50 percent or more of the stand is composed of upland oak, hickory, yellow-poplar, soft maple, and other associated hardwood species, except in cases where yellow pines make up 25 to 49 percent and the stand would be classified as oak-pine.

Maple-beech-birch type: Upland hardwood forests in which 50 percent or more of the stand is sugar maple, beech, or yellow birch, singly or in combination, except where yellow pines make up 25 to 49 percent of the stand.

Oak-gum-cypress type: Bottomland forests in which 50 percent or more of the stand is tupelo, blackgum, sweetgum, ash, low-land oak, elm, soft maple, cypress, and other associated species, except where pines comprise 25 to 49 percent of the stand. In the mountains, flat areas of forest bordering streams may be given this classification. River birch, sycamore, willow, and alder are characteristic of such areas.

Site Quality

Site quality of pine and oak-pine types is based on the total height of pine at age 50 years. For loblolly pine and oak-loblolly pine types, an index of 60 feet or shorter is regarded as poor site, 70 fair site, and 80 and taller good site.

For other pine and oak-pine types, a site index of 50 feet or shorter is considered poor site, 60 fair site, and 70 and taller good site.

Site quality of hardwood types is based upon the number of 16-foot saw logs in hardwood trees at maturity. Sites capable of growing hardwoods with three or more saw logs are considered good sites, 2 logs fair sites, and 1 log and less poor sites.

Stand-Size Classes

Sawtimber: Stands containing at least 1,500 board-feet net volume per acre, International $\frac{1}{4}$-inch log rule, in sound, live, softwood trees 9.0 inches d.b.h. or larger, or hardwood trees 11.0 inches d.b.h. or larger. Two classes of sawtimber stands are recognized:

> Large sawtimber: Stands of sawtimber having more than 50 percent of the net board-foot volume in trees 15.0 inches d.b.h. or larger.
>
> Small sawtimber: Stands of sawtimber having 50 percent or more of the net board-foot volume in trees smaller than 15.0 inches d.b.h.

Poletimber: Stands failing to meet the minimum sawtimber specifications, but at least 10 percent stocked with trees 5.0 inches d.b.h. or larger and with at least half the minimum stocking in pole-size trees.

Seedlings and saplings: Stands not qualifying as sawtimber or poletimber stands, but having at least a 10-percent stocking of trees of commercial species and with half the minimum stocking in seedlings and saplings.

Nonstocked and other areas: Forest areas not qualifying as sawtimber, poletimber, or seedling and sapling stands.

Diameters

> D.b.h. (diameter at breast height): Stem diameter in inches, outside bark, measured at $4\frac{1}{2}$ feet above the ground.
>
> Diameter class: All trees were tallied by 2-inch diameter classes, each class including diameters 1.0 inch below and 0.9 inch above the stated midpoint, e.g., trees 7.0 to and including 8.9 inches are included in the 8-inch class. Corresponding limits apply to other diameter classes.

Timber Quality Classification

Growing Stock

Sawtimber trees: Live softwood trees 9.0 inches d.b.h. or larger and hardwood trees 11.0 inches d.b.h. or larger, with a sound volume of at least 50 percent of the gross board-foot volume up to the point of minimum saw-log merchantability. To be considered sound, a saw log must be at least 8 feet long, must be at least 50 percent sound, and must meet the following additional requirements:

Softwood logs[2/] must have a scaling diameter of 6 inches or more, and sweep or crook must not exceed one-third of the scaling diameter per 8 feet of log length.

Hardwood logs must have a scaling diameter of 8 inches or more and must pass specifications[3/] for standard lumber logs or tie and timber logs.

Sound poletimber trees: Straight-boled trees between 5.0 inches d.b.h. and sawtimber size that can be expected to become sawtimber.

Sound saplings: Trees 1.0 inch to 4.9 inches d.b.h. which show promise of growing into sawtimber.

Other Material

Sound cull trees: Live trees of all sizes that are unmerchantable for saw logs now or prospectively because of species, poor form, excessive limbiness, or other sound defect.

2/ For detailed specifications of log grades, see "Interim log grades for southern pine." Southern Forest Expt. Station, 18 pp. 1953.

3/ For detailed hardwood log grade specifications, see "Hardwood log grades for standard lumber: proposals and results." U. S. Forest Products Laboratory, D1737. 1949.

Rotten cull trees: Live trees of all sizes that are unmerchantable for saw logs now or prospectively because of rotten defect.

Hardwood limbs: The limb volume of all hardwood sawtimber and cull trees to a minimum diameter of 4.0 inches inside bark.

Species Groups

Yellow pines: Includes loblolly, pond, shortleaf, pitch, Table-Mountain, and Virginia pine.

Other softwoods: White pine, hemlock, spruce, fir, cypress, eastern red-cedar, and whitecedar.

Soft hardwoods: Blackgum, tupelo, yellow-poplar, sweetgum, cottonwood, soft maple, basswood, willow, elm, hackberry, sycamore, magnolia, sweetbay, and black cherry.

Hard hardwoods: All the oaks, hickories, ash, beech, hard maple, birch, black walnut, black locust, honeylocust, mulberry, sourwood, dogwood, holly, and persimmon.

Volume Estimates

Board-foot volume: The volume in board-feet, measured by the International $\frac{1}{4}$-inch rule, exclusive of defect, of that portion of sound sawtimber trees between the stump and the upper limit of merchantability for saw logs.

Volume in cords: For sound trees the volume in standard cords (including bark) of the sound portion of trees 5.0 inches d.b.h. or larger, between stump and a minimum top stem diameter of 4.0 inches inside bark. Similar volumes are given for cull trees. The volume in limbs which are at least 4.0 inches in diameter inside bark is shown separately.

Volume in cubic feet: Cubic-foot volume of the same material shown in cords except that bark is not included.

International $\frac{1}{4}$-inch log rule: A rule for estimating the board-foot volume of 4-foot log sections, according to the formula $V = .905\ (0.22D^2 - 0.71D)$. The taper allowance for computing the volume in log lengths greater than four feet is 0.5 inch per 4-foot section. Allowance for saw kerf is $\frac{1}{4}$ inch.

Standard cord: A stacked pile, 4 x 4 x 8 feet, of round or split bolts, estimated to contain, on the average, about 74 cubic feet of solid wood.

Growth and Timber Cut

Net growth: The growth on trees that were of volume size at the beginning of the year and the ingrowth resulting from smaller trees growing into volume size during the year, minus the partial loss of growth on trees that died or were cut during the year and the loss of volume in trees dying from natural causes during the year. Net growth is based on growth of sound trees. Growth on "Other material" is not included.

> In board-feet: The change during the calendar year in sawtimber volume resulting from growth, ingrowth, and mortality losses.
>
> In cubic feet or cords: The change during the calendar year in the volume of all sound trees 5.0 inches and larger resulting from growth, ingrowth, and mortality losses.

Timber cut: The volume of timber cut is based on the measurement and tally of stumps found on regular ground sample plots. Stumps of all trees cut during the past 3-year period are recorded and the measurements are converted into equivalent tree volume. The average yearly volume of timber cut for the 3-year period is then taken as the annual estimate. Board-foot volumes include the saw-log portion of all sawtimber-size trees which were cut. Estimates in cubic feet or cords include the entire stem from stump to 4.0-inch top of all sound trees 5.0 inches in diameter and larger. Timber cut from cull or dead trees is not included.

Stocking

Stocking is the extent to which growing space is effectively utilized by trees. The number of stems present by d.b.h. classes was used as a basis for stocking classification. Areas having the minimum numbers of trees listed below, either in a single diameter class or proportionately in any combinations of diameter classes, were considered fully stocked.

D.b.h.	Minimum number trees per acre
Seedlings	1,000
2 inches	800
4 inches	590
6 inches	400
8 inches	240
10 inches	155
12 inches	115
14 inches	90

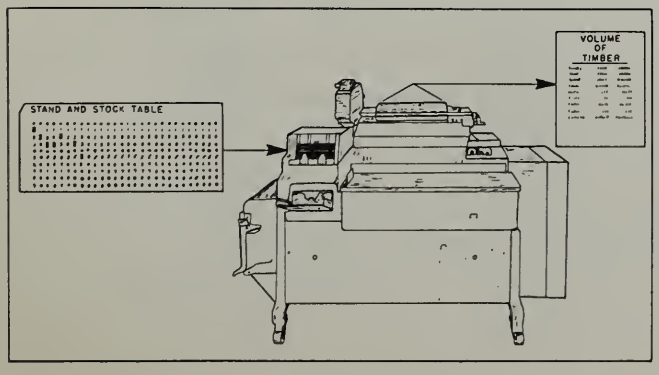
How the Forest Inventory Is Made

The present system of inventory is a two-step method which includes land-use classification of points on aerial photographs followed by the cruising of ground sample plots. The county is the basic work unit. The detailed procedure is as follows:

1. Preliminary estimates of the acreage of land in forests and other land-use classes are obtained by classifying points printed on every third aerial photograph in alternate flight lines within a county. The proportion of points falling in each class is used to estimate the acreage. This estimate is later checked and revised through the use of ground plots.

2. Ground sample plots are selected in a systematic manner from the forest land classifications made in Step 1, using an interval which will provide sufficient plots to meet established limits of error per billion cubic feet of timber. This results in a proportional sample of all existing timber stands. Timber cruisers make a detailed description and tally of the ground plots to obtain data on timber volume, quality, stocking, mortality, and timber cut. Samples of agricultural and other photo classifications are also checked on the ground to verify or adjust the area estimates based on these classifications.

3. Growth estimates are based on increment borings taken proportionally from sample trees of various diameters and species in each forest type and stand class. The volume of timber cut is computed from a tally of the stumps of trees cut on the plots during a specified period.



4. All field data are sent to Asheville for editing and are placed on punch cards for machine sorting and tabulation. Final estimates are based on statistical summaries of the data.

Table 11.--Gross area[1] by broad use class

Class of use	Area	
	Thousand acres	Percent
Forest land:		
Commercial	15,449.9	59.1
Noncommercial:		
Productive-reserved	259.4	1.0
Unproductive	404.2	1.6
Total forest	16,113.5	61.7
Nonforest land:		
Agriculture	8,156.2	31.2
Urban and other[2]	1,137.2	4.4
Total nonforest	9,293.4	35.6
Total land area	25,406.9	97.3
Total water area[3]	714.6	2.7
All classes	26,121.5	100.0

1/ From U. S. Bureau of the Census, 1950.

2/ Includes urban, suburban residential, and rural industrial areas, rights-of-way, cemeteries, schools, etc., and a small area of marsh.

3/ Includes 590,100 acres of Census water as of 1950 plus 31,800 acres of Census water created since 1950 and 92,700 acres classified by the Forest Survey as water but defined by the Bureau of Census as land.

Table 12.--Ownership of commercial forest land

Class of ownership	Commercial forest land	
	Thousand acres	Percent
Public land:		
National forest	1,197.6	7.8
Indian	--	--
Other Federal	190.6	1.2
Total Federal	1,388.2	9.0
State	87.2	0.6
County and municipal	51.8	0.3
Total public	1,527.2	9.9
Private land:		
Farm	10,085.1	65.3
Wood-using industries	1,238.7	8.0
Other	2,598.9	16.8
Total private	13,922.7	90.1
All classes	15,449.9	100.0

Table 13.--Commercial forest area by forest type and stand-size class

(In thousand acres)

Forest type[1]	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Softwood types:						
Loblolly pine[2]	228.6	838.9	463.0	115.9	20.0	1,666.4
Shortleaf pine	47.8	394.4	676.2	154.8	4.0	1,277.2
Virginia pine	7.3	278.2	771.1	363.6	21.1	1,441.3
White pine	42.6	37.8	29.7	3.9	4.0	118.0
Total	326.3	1,549.3	1,940.0	638.2	49.1	4,502.9
Hardwood types:						
Oak-pine	138.0	451.3	666.8	142.9	7.5	1,406.5
Oak-hickory	1,871.9	2,059.3	3,622.7	829.0	170.0	8,552.9
Maple-beech-birch	20.4	14.0	14.8	--	2.8	52.0
Oak-gum-cypress	363.6	217.8	220.1	91.8	42.3	935.6
Total	2,393.9	2,742.4	4,524.4	1,063.7	222.6	10,947.0
All types	2,720.2	4,291.7	6,464.4	1,701.9	271.7	15,449.9
Percent	17.6	27.8	41.8	11.0	1.8	100.0

[1] See description of forest type and stand-size class under "Definition of Terms."
[2] Includes 22,100 acres of pond pine type.

Table 14.--Commercial forest area by forest type and site quality[1]

(In thousand acres)

Forest type	Poor site	Fair site	Good site	All sites
Softwood types:				
Loblolly pine	351.2	695.6	619.6	1,666.4
Shortleaf pine	411.9	567.6	297.7	1,277.2
Virginia pine	275.7	801.3	364.3	1,441.3
White pine	14.7	44.6	58.7	118.0
Total	1,053.5	2,109.1	1,340.3	4,502.9
Hardwood types:				
Oak-pine	263.2	522.5	620.8	1,406.5
Oak-hickory	585.7	5,512.0	2,455.2	8,552.9
Maple-beech-birch	1.0	12.8	38.2	52.0
Oak-gum-cypress	44.9	284.5	606.2	935.6
Total	894.8	6,331.8	3,720.4	10,947.0
All types	1,948.3	8,440.9	5,060.7	15,449.9
Percent	12.6	54.6	32.8	100.0

[1] See description of forest type and site quality under "Definition of Terms."

Table 15.--Net volume[1] of sawtimber by species and stand-size class

(In million board-feet)

Species[2]	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Softwoods:						
Loblolly pine[3]	1,762.3	4,592.5	305.2	17.8	6.8	6,684.6
Shortleaf pine	366.1	1,739.8	520.0	18.8	3.5	2,648.2
Virginia pine	155.6	1,136.2	320.3	6.0	3.0	1,621.1
Total	2,284.0	7,468.5	1,145.5	42.6	13.3	10,953.9
White pine	299.2	206.3	40.4	2.6	1.6	550.1
Hemlock	349.8	46.5	10.7	--	--	407.0
Cypress	180.7	46.3	1.1	--	--	228.1
Cedar	9.5	46.1	10.5	--	--	66.1
Total sftwds.	3,123.2	7,813.7	1,208.2	45.2	14.9	12,205.2
Hardwoods:						
Blackgum	658.2	345.3	58.6	6.5	0.6	1,069.2
Sweetgum	776.7	631.6	97.6	23.9	2.1	1,531.9
Yellow-poplar	1,580.3	927.8	358.5	22.9	5.5	2,895.0
Cottonwood	3.2	--	--	--	--	3.2
Soft maple	506.9	323.3	82.3	9.0	--	921.5
Basswood	118.3	66.0	29.1	--	--	213.4
Other soft hdwds.	527.5	126.6	85.4	5.9	3.0	748.4
Total	4,171.1	2,420.6	711.5	68.2	11.2	7,382.6
White & swamp chestnut oaks	1,488.4	1,677.9	450.0	11.3	8.0	3,635.6
Other white oaks	1,120.7	871.4	378.7	21.6	6.3	2,398.7
Northern red & swamp red oaks	1,098.6	522.3	134.8	4.2	5.6	1,765.5
Other red oaks	1,872.8	1,592.6	485.5	23.4	6.6	3,980.9
Hickory	1,145.9	739.3	251.2	39.1	1.4	2,176.9
Ash	142.5	69.8	47.3	--	--	259.6
Beech	434.9	135.8	44.6	1.1	--	616.4
Sugar maple	106.9	36.2	14.7	2.7	--	160.5
Yellow birch	13.7	6.3	--	--	--	20.0
Black walnut	93.0	55.7	16.8	4.9	4.0	174.4
Other hard hdwds.	268.3	98.1	50.0	2.6	13.8	432.8
Total	7,785.7	5,805.4	1,873.6	110.9	45.7	15,621.3
Total hdwds.	11,956.8	8,226.0	2,585.1	179.1	56.9	23,003.9
All species	15,080.0	16,039.7	3,793.3	224.3	71.8	35,209.1
Percent	42.8	45.6	10.8	0.6	0.2	100.0

1/ Log scale, International 1/4-inch rule.
2/ See "Definition of Terms" for species combined with others.
3/ Includes 73.2 million board-feet of pond pine.

Table 16.--Net volume[1] of sawtimber by species and diameter class

Species	10-12 inches[2]	14-18 inches	20-24 inches	26+ inches	All diameters	
	Million bd.-ft.	Million bd.-ft.	Million bd.-ft.	Million bd.-ft.	Million bd.-ft.	Percent
Softwoods:						
Loblolly pine	3,098.8	2,976.2	575.6	34.0	6,684.6	19.0
Shortleaf pine	1,759.7	759.9	128.6	--	2,648.2	7.5
Virginia pine	1,237.8	363.6	19.7	--	1,621.1	4.6
Total	6,096.3	4,099.7	723.9	34.0	10,953.9	31.1
White pine	175.1	237.8	129.8	7.4	550.1	1.6
Hemlock	45.7	87.1	95.7	178.5	407.0	1.2
Cypress	51.8	117.5	29.8	29.0	228.1	0.6
Cedar	44.1	18.9	3.1	--	66.1	0.2
Total sftwds.	6,413.0	4,561.0	982.3	248.9	12,205.2	34.7
Hardwoods:						
Blackgum	240.3	605.1	161.1	62.7	1,069.2	3.1
Sweetgum	426.3	867.3	211.3	27.0	1,531.9	4.4
Yellow-poplar	620.4	1,593.5	501.4	179.7	2,895.0	8.2
Cottonwood	--	3.2	--	--	3.2	(3/)
Soft maple	245.7	480.7	160.5	34.6	921.5	2.6
Basswood	71.4	121.8	20.2	--	213.4	0.6
Other soft hdwds.	136.2	383.4	172.1	56.7	748.4	2.1
Total	1,740.3	4,055.0	1,226.6	360.7	7,382.6	21.0
White & swamp chestnut oaks	964.7	1,962.6	505.4	202.9	3,635.6	10.3
Other white oaks	619.6	1,148.4	392.5	238.2	2,398.7	6.8
Northern red & swamp red oaks	265.1	833.4	351.1	315.9	1,765.5	5.0
Other red oaks	912.1	2,055.0	554.4	459.4	3,980.9	11.3
Hickory	495.0	1,195.7	324.2	162.0	2,176.9	6.2
Ash	77.9	147.1	34.6	--	259.6	0.7
Beech	72.2	300.3	166.1	77.8	616.4	1.7
Sugar maple	27.2	86.8	27.2	19.3	160.5	0.5
Yellow birch	2.1	13.6	4.3	--	20.0	0.1
Black walnut	42.4	120.3	11.7	--	174.4	0.5
Other hard hdwds.	112.2	215.0	98.1	7.5	432.8	1.2
Total	3,590.5	8,078.2	2,469.6	1,483.0	15,621.3	44.3
Total hdwds.	5,330.8	12,133.2	3,696.2	1,843.7	23,003.9	65.3
All species	11,743.8	16,694.2	4,678.5	2,092.6	35,209.1	100.0
Percent	33.4	47.4	13.3	5.9	100.0	--

1/ Log scale, International 1/4-inch rule.

2/ Ten-inch hardwoods are not included since they are below sawtimber size.

3/ Less than 0.05 percent.

Table 17.--Net volume[1/] of sawtimber by forest type and stand-size class

(In million board-feet)

Forest type	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Softwood types:						
Loblolly pine	1,659.8	4,868.6	274.1	13.0	7.4	6,822.9
Shortleaf pine	263.4	1,495.5	360.6	9.4	--	2,128.9
Virginia pine	39.1	1,053.9	311.7	7.2	--	1,411.9
White pine	462.5	122.9	12.8	--	--	598.2
Total	2,424.8	7,540.9	959.2	29.6	7.4	10,961.9
Hardwood types:						
Oak-pine	913.1	1,484.5	381.5	14.9	--	2,794.0
Oak-hickory	9,303.5	6,097.8	2,294.3	171.6	57.3	17,924.5
Maple-beech-birch	64.0	29.6	5.7	--	0.2	99.5
Oak-gum-cypress	2,374.6	886.9	152.6	8.2	6.9	3,429.2
Total	12,655.2	8,498.8	2,834.1	194.7	64.4	24,247.2
All types	15,080.0	16,039.7	3,793.3	224.3	71.8	35,209.1
Percent	42.8	45.6	10.8	0.6	0.2	100.0

1/ Log scale, International 1/4-inch rule.

Table 18.--Net volume of sawtimber by species group, log grade, and tree-size class

YELLOW PINES

Log grade	10 - 14 inches[1/]		16+ inches		All trees	
	Million bd.-ft.	Percent	Million bd.-ft.	Percent	Million bd.-ft.	Percent
Grade 1	--	--	101.2	3.7	101.2	0.9
Grade 2	1,354.5	16.4	1,015.9	37.6	2,370.4	21.7
Grade 3	5,113.1	62.0	992.0	36.7	6,105.1	55.7
Grade 4	1,780.9	21.6	596.3	22.0	2,377.2	21.7
Total	8,248.5	100.0	2,705.4	100.0	10,953.9	100.0

OTHER SOFTWOODS

Grade 1	--	--	53.7	6.9	53.7	4.3
Grade 2	66.4	14.0	157.1	20.2	223.5	17.9
Grade 3	345.8	72.7	417.9	53.9	763.7	61.0
Grade 4	63.1	13.3	147.3	19.0	210.4	16.8
Total	475.3	100.0	776.0	100.0	1,251.3	100.0

SOFT HARDWOODS

Grade 1	--	--	694.1	17.7	694.1	9.4
Grade 2	271.2	7.8	922.5	23.5	1,193.7	16.2
Grade 3	1,230.5	35.6	1,024.6	26.1	2,255.1	30.5
Grade 4	1,957.6	56.6	1,282.1	32.7	3,239.7	43.9
Total	3,459.3	100.0	3,923.3	100.0	7,382.6	100.0

HARD HARDWOODS

Grade 1	--	--	1,411.7	16.8	1,411.7	9.0
Grade 2	268.6	3.7	1,728.2	20.5	1,996.8	12.8
Grade 3	1,117.8	15.6	1,790.3	21.2	2,908.1	18.6
Grade 4	5,805.1	80.7	3,499.6	41.5	9,304.7	59.6
Total	7,191.5	100.0	8,429.8	100.0	15,621.3	100.0

1/ Ten-inch hardwoods are not included since they are below sawtimber size.

Table 19.--Net volume[1] of all timber by species and stand-size class

(In thousand cords)

GROWING STOCK

Species	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Softwoods:						
Loblolly pine[2]	4,622	16,618	3,969	109	27	25,345
Shortleaf pine	1,116	8,003	5,997	106	33	15,255
Virginia pine	655	6,285	6,931	58	15	13,944
Total	6,393	30,906	16,897	273	75	54,544
White pine	609	735	214	17	5	1,580
Hemlock	679	218	63	--	--	960
Cypress	386	147	3	--	--	536
Cedar	65	213	302	5	--	585
Total sftwds.	8,132	32,219	17,479	295	80	58,205
Hardwoods:						
Blackgum	2,444	1,926	561	51	2	4,984
Sweetgum	2,830	3,473	1,455	95	6	7,859
Yellow-poplar	4,724	3,765	3,217	101	16	11,823
Cottonwood	8	--	14	--	--	22
Soft maple	2,307	1,791	1,253	47	--	5,398
Basswood	436	256	189	--	--	881
Other soft hdwds.	1,756	887	1,050	26	12	3,731
Total	14,505	12,098	7,739	320	36	34,698
White & swamp chestnut oaks	5,531	9,036	4,826	111	22	19,526
Other white oaks	3,861	4,987	4,720	81	29	13,678
Northern red & swamp red oaks	3,207	2,150	1,724	62	17	7,160
Other red oaks	6,116	7,588	6,528	129	24	20,385
Hickory	4,387	3,962	2,572	153	5	11,079
Ash	772	474	448	--	--	1,694
Beech	1,284	750	359	4	7	2,404
Sugar maple	377	237	152	10	1	777
Yellow birch	83	25	37	--	--	145
Black walnut	304	250	322	56	13	945
Dogwood, holly	234	275	255	9	--	773
Other hard hdwds.	1,219	615	1,057	66	53	3,010
Total	27,375	30,349	23,000	681	171	81,576
Total hdwds.	41,880	42,447	30,739	1,001	207	116,274
All species	50,012	74,666	48,218	1,296	287	174,479
Percent	28.7	42.8	27.6	0.7	0.2	100.0

OTHER MATERIAL

Sound culls:						
Softwoods	316	1,179	2,641	368	81	4,585
Hardwoods	7,006	5,720	9,923	1,276	651	24,576
Rotten culls	890	656	789	157	32	2,524
Total other material	8,212	7,555	13,353	1,801	764	31,685

1/ Sound wood and bark.
2/ Includes 192,000 cords of pond pine.

Table 20.--Net volume[1/] of all timber by species and diameter class

(In thousand cords)

GROWING STOCK

Species	Diameter class						All diameters
	6 inches	8 inches	10 inches	12 inches	14-18 inches	20+ inches	
Softwoods:							
Loblolly pine	3,210	4,321	4,346	4,855	7,278	1,335	25,345
Shortleaf pine	3,355	4,141	3,182	2,390	1,906	281	15,255
Virginia pine	4,577	4,423	2,549	1,406	944	45	13,944
Total	11,142	12,885	10,077	8,651	10,128	1,661	54,544
White pine	116	284	197	254	490	239	1,580
Hemlock	48	97	56	88	197	474	960
Cypress	--	59	56	78	240	103	536
Cedar	271	163	69	37	38	7	585
Total sftwds.	11,577	13,488	10,455	9,108	11,093	2,484	58,205
Hardwoods:							
Blackgum	540	680	791	803	1,667	503	4,984
Sweetgum	962	1,275	1,576	1,284	2,227	535	7,859
Yellow-poplar	1,138	1,721	1,587	1,814	4,071	1,492	11,823
Cottonwood	3	11	--	--	8	--	22
Soft maple	1,063	969	736	812	1,346	472	5,398
Basswood	40	103	169	207	317	45	881
Other soft hdwds.	502	588	658	453	1,012	518	3,731
Total	4,248	5,347	5,517	5,373	10,648	3,565	34,698
White & swamp chestnut oaks	2,499	3,212	3,287	3,255	5,529	1,744	19,526
Other white oaks	1,915	2,666	2,055	2,145	3,290	1,607	13,678
Northern red & swamp red oaks	728	927	729	887	2,305	1,584	7,160
Other red oaks	2,684	3,187	3,403	3,013	5,687	2,411	20,385
Hickory	1,261	1,734	1,873	1,717	3,361	1,133	11,079
Ash	196	339	428	256	396	79	1,694
Beech	187	204	346	241	835	591	2,404
Sugar maple	76	159	79	97	249	117	777
Yellow birch	36	20	28	8	41	12	145
Black walnut	81	112	233	146	344	29	945
Dogwood, holly	341	155	147	49	81	--	773
Other hard hdwds.	805	452	611	347	536	259	3,010
Total	10,809	13,167	13,219	12,161	22,654	9,566	81,576
Total hdwds.	15,057	18,514	18,736	17,534	33,302	13,131	116,274
All species	26,634	32,002	29,191	26,642	44,395	15,615	174,479
Percent	15.3	18.3	16.7	15.3	25.4	9.0	100.0

OTHER MATERIAL

Sound culls:							
Softwoods	909	1,001	1,182	776	548	169	4,585
Hardwoods	3,619	3,758	3,448	2,999	5,923	4,829	24,576
Rotten culls	274	379	435	96	454	886	2,524
Total other material	4,802	5,138	5,065	3,871	6,925	5,884	31,685

1/ Sound wood and bark.

Table 21.--Net volume[1] of all timber by species and class of material

(In thousand cords)

Species	Growing stock				Other material	
	Sawtimber trees		Pole-timber trees	Total sound trees	Sound culls	Rotten culls
	Saw-log portion	Upper stems				
Softwoods:						
Loblolly pine	14,398	3,416	7,531	25,345	520	34
Shortleaf pine	5,903	1,856	7,496	15,255	651	10
Virginia pine	3,885	1,059	9,000	13,944	3,068	17
Total	24,186	6,331	24,027	54,544	4,239	61
White pine	1,012	168	400	1,580	109	4
Hemlock	632	183	145	960	137	2
Cypress	390	87	59	536	74	21
Cedar	115	36	434	585	26	12
Total sftwds.	26,335	6,805	25,065	58,205	4,585	100
Hardwoods:						
Blackgum	2,215	758	2,011	4,984	1,383	181
Sweetgum	3,190	856	3,813	7,859	618	63
Yellow-poplar	5,892	1,485	4,446	11,823	758	159
Cottonwood	6	2	14	22	11	--
Soft maple	1,916	714	2,768	5,398	2,658	269
Basswood	471	98	312	881	116	46
Other soft hdwds.	1,497	486	1,748	3,731	1,139	49
Total	15,187	4,399	15,112	34,698	6,683	767
White & swamp chestnut oaks	7,273	3,255	8,998	19,526	1,998	166
Other white oaks	4,896	2,146	6,636	13,678	5,561	288
Northern red & swamp red oaks	3,482	1,294	2,384	7,160	1,203	127
Other red oaks	7,975	3,136	9,274	20,385	2,208	197
Hickory	4,413	1,798	4,868	11,079	1,280	125
Ash	563	168	963	1,694	447	32
Beech	1,229	438	737	2,404	1,075	193
Sugar maple	333	130	314	777	348	79
Yellow birch	41	20	84	145	102	9
Black walnut	367	152	426	945	306	39
Dogwood, holly	91	39	643	773	301	18
Scrub oak[2]	--	--	--	--	1,048	31
Other hard hdwds.	823	319	1,868	3,010	2,016	353
Total	31,486	12,895	37,195	81,576	17,893	1,657
Total hdwds.	46,673	17,294	52,307	116,274	24,576	2,424
All species	73,008	24,099	77,372	174,479	29,161	2,524
Percent	41.8	13.8	44.4	100.0	92.0	8.0

1/ Sound wood and bark.
2/ Includes noncommercial species.

Table 22.--Net volume[1/] of all timber by forest type and stand-size class

(In thousand cords)

GROWING STOCK

Forest type	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Seedling & sapling stands	Poorly stocked stands & unstocked areas	All stands
Softwood types:						
Loblolly pine	5,071	19,399	4,240	72	35	28,817
Shortleaf pine	820	7,335	5,195	69	--	13,419
Virginia pine	129	5,593	7,113	140	7	12,982
White pine	1,064	535	136	5	--	1,740
Total	7,084	32,862	16,684	286	42	56,958
Hardwood types:						
Oak-pine	3,021	7,405	4,332	79	--	14,837
Oak-hickory	31,648	30,142	25,308	864	214	88,176
Maple-beech-birch	219	133	84	--	3	439
Oak-gum-cypress	8,040	4,124	1,810	67	28	14,069
Total	42,928	41,804	31,534	1,010	245	117,521
All types	50,012	74,666	48,218	1,296	287	174,479
Percent	28.7	42.8	27.6	0.7	0.2	100.0

OTHER MATERIAL

Softwood types:						
Loblolly pine	299	664	373	86	3	1,425
Shortleaf pine	36	483	784	23	12	1,338
Virginia pine	14	575	1,771	267	39	2,666
White pine	127	101	45	--	19	292
Total	476	1,823	2,973	376	73	5,721
Hardwood types:						
Oak-pine	295	604	1,024	94	61	2,078
Oak-hickory	6,018	4,276	8,733	1,305	522	20,854
Maple-beech-birch	84	63	98	--	7	252
Oak-gum-cypress	1,339	789	525	26	101	2,780
Total	7,736	5,732	10,380	1,425	691	25,964
All types	8,212	7,555	13,353	1,801	764	31,685
Percent	25.9	23.9	42.1	5.7	2.4	100.0

1/ Sound wood and bark.

Table 23.--Net volume[1] of all timber by species and diameter class

(In million cubic feet)

GROWING STOCK

Species	Diameter class						All diameters
	6 inches	8 inches	10 inches	12 inches	14-18 inches	20+ inches	
Softwoods:							
Loblolly pine[2]	189.4	288.2	334.3	372.3	585.8	112.5	1,882.5
Shortleaf pine	198.0	279.2	228.6	181.7	153.0	23.6	1,064.1
Virginia pine	271.7	297.3	179.8	106.1	74.3	3.7	932.9
Total	659.1	864.7	742.7	660.1	813.1	139.8	3,879.5
White pine	8.1	21.2	15.7	21.5	43.0	22.5	132.0
Hemlock	3.5	6.6	4.6	7.5	17.7	45.9	85.8
Cypress	--	4.3	4.0	6.7	21.1	10.0	46.1
Cedar	17.9	12.2	5.1	3.3	3.5	0.6	42.6
Total sftwds.	688.6	909.0	772.1	699.1	898.4	218.8	4,186.0
Hardwoods:							
Blackgum	30.9	44.9	57.0	62.4	132.9	41.6	369.7
Sweetgum	55.1	84.3	113.3	96.1	175.4	44.1	568.3
Yellow-poplar	69.0	113.3	113.8	138.0	322.8	123.8	880.7
Cottonwood	0.2	0.7	--	--	0.6	--	1.5
Soft maple	63.2	63.6	53.2	61.5	106.9	38.7	387.1
Basswood	2.4	6.7	11.9	16.0	25.1	3.7	65.8
Other soft hdwds.	30.3	37.5	47.5	34.7	81.4	42.7	274.1
Total	251.1	351.0	396.7	408.7	845.1	294.6	2,547.2
White & swamp chestnut oaks	146.3	210.3	237.1	246.3	439.0	144.1	1,423.1
Other white oaks	113.9	174.4	148.9	161.6	261.1	133.3	993.2
Northern red & swamp red oaks	43.2	59.8	53.3	67.1	184.3	131.1	538.8
Other red oaks	156.7	208.4	247.2	230.1	448.9	199.5	1,490.8
Hickory	75.1	113.1	135.2	130.7	265.1	93.4	812.6
Ash	12.1	22.0	30.6	19.9	31.1	6.4	122.1
Beech	11.5	13.2	25.1	18.2	66.1	49.1	183.2
Sugar maple	5.5	10.3	6.1	7.2	20.1	9.7	58.9
Yellow birch	2.2	1.2	2.0	0.6	3.3	1.0	10.3
Black walnut	4.9	7.2	16.9	11.2	27.5	2.4	70.1
Dogwood, holly	19.9	10.1	10.7	3.4	6.2	--	50.3
Other hard hdwds.	52.2	28.9	44.3	26.5	43.2	21.3	216.4
Total	643.5	858.9	957.4	922.8	1,795.9	791.3	5,969.8
Total hdwds.	894.6	1,209.9	1,354.1	1,331.5	2,641.0	1,085.9	8,517.0
All species	1,583.2	2,118.9	2,126.2	2,030.6	3,539.4	1,304.7	12,703.0
Percent	12.5	16.7	16.7	16.0	27.8	10.3	100.0

OTHER MATERIAL

Sound culls:							
Softwoods	53.1	67.3	84.8	59.1	44.4	15.7	324.4
Hardwoods	211.9	247.5	248.3	227.1	472.6	399.8	1,807.2
Rotten culls	17.6	26.6	30.6	10.2	35.4	73.8	194.2
Total other material	282.6	341.4	363.7	296.4	552.4	489.3	2,325.8

1/ Excludes bark.

2/ Includes 14.7 million cubic feet of pond pine.

Table 24.--Net volume[1] of all timber by species and class of material

(In million cubic feet)

Species	Growing stock				Other material	
	Sawtimber trees		Pole-timber trees	Total sound trees	Sound culls	Rotten culls
	Saw-log portion	Upper stems				
Softwoods:						
Loblolly pine	1,118.1	286.8	477.6	1,882.5	36.7	2.7
Shortleaf pine	443.5	143.4	477.2	1,064.1	45.4	0.7
Virginia pine	295.7	68.2	569.0	932.9	213.0	1.2
Total	1,857.3	498.4	1,523.8	3,879.5	295.1	4.6
White pine	90.3	12.4	29.3	132.0	8.8	0.3
Hemlock	59.5	16.2	10.1	85.8	11.7	0.2
Cypress	35.0	6.8	4.3	46.1	7.1	2.1
Cedar	10.4	2.1	30.1	42.6	1.7	0.9
Total sftwds.	2,052.5	535.9	1,597.6	4,186.0	324.4	8.1
Hardwoods:						
Blackgum	179.7	57.2	132.8	369.7	101.6	14.0
Sweetgum	257.6	58.0	252.7	568.3	45.4	4.6
Yellow-poplar	472.8	111.8	296.1	880.7	56.3	12.8
Cottonwood	0.5	0.1	0.9	1.5	0.7	--
Soft maple	153.1	54.0	180.0	387.1	193.5	19.3
Basswood	36.8	8.0	21.0	65.8	8.8	3.7
Other soft hdwds.	120.4	38.4	115.3	274.1	82.6	4.1
Total	1,220.9	327.5	998.8	2,547.2	488.9	58.5
White & swamp chestnut oaks	584.5	244.9	593.7	1,423.1	152.0	12.4
Other white oaks	391.0	165.0	437.2	993.2	417.8	22.9
Northern red & swamp red oaks	279.3	103.2	156.3	538.8	92.9	10.3
Other red oaks	639.3	239.2	612.3	1,490.8	162.3	14.5
Hickory	351.4	137.8	323.4	812.6	92.9	9.7
Ash	44.7	12.7	64.7	122.1	32.1	2.3
Beech	98.9	34.5	49.8	183.2	84.1	15.4
Sugar maple	26.9	10.1	21.9	58.9	26.4	6.1
Yellow birch	3.4	1.5	5.4	10.3	7.3	0.8
Black walnut	29.2	11.9	29.0	70.1	21.8	3.1
Dogwood, holly	6.7	2.9	40.7	50.3	19.1	1.3
Scrub oak[2]	--	--	--	--	69.4	2.7
Other hard hdwds.	65.5	25.5	125.4	216.4	140.2	26.1
Total	2,520.8	989.2	2,459.8	5,969.8	1,318.3	127.6
Total hdwds.	3,741.7	1,316.7	3,458.6	8,517.0	1,807.2	186.1
All species	5,794.2	1,852.6	5,056.2	12,703.0	2,131.6	194.2
Percent	45.6	14.6	39.8	100.0	91.7	8.3

1/ Excludes bark.
2/ Includes noncommercial species.

Table 25.--Average volume[1] per acre of sawtimber by forest type, species group, and stand-size class

(In board-feet)

Forest type and species group	Large sawtimber stands	Small sawtimber stands	Pole-timber stands	Other stand sizes	All stands
Loblolly pine					
Softwood	6,079	5,256	520	127	3,635
Hardwood	1,182	547	72	24	459
Shortleaf pine					
Softwood	4,750	3,398	495	51	1,495
Hardwood	752	395	38	8	171
Virginia pine					
Softwood	4,176	2,996	327	16	779
Hardwood	1,116	792	77	3	201
White pine					
Softwood	9,644	2,958	431	--	4,533
Hardwood	1,231	286	--	--	535
All pine types					
Softwood	6,306	4,321	433	46	2,137
Hardwood	1,124	546	61	8	297
Oak-pine					
Softwood	2,565	1,385	280	39	833
Hardwood	4,050	1,903	292	60	1,153
Oak-hickory					
Softwood	256	193	49	21	126
Hardwood	4,714	2,768	584	208	1,970
Maple-beech-birch					
Softwood	51	--	--	--	20
Hardwood	3,086	2,128	381	80	1,894
Oak-gum-cypress					
Softwood	634	441	19	16	356
Hardwood	5,899	3,630	675	97	3,309
All hdwd. types[2]					
Softwood	315	215	47	20	148
Hardwood	4,890	2,846	589	195	2,101
All types					
Softwood	1,148	1,821	187	31	790
Hardwood	4,396	1,917	400	119	1,489

1/ Log scale, International 1/4-inch rule.
2/ Oak-pine type not included.

Table 26.--Average volume[1] per acre of all trees by forest type, species group, and stand-size class

(In standard cords)

Forest type and species group	Large sawtimber stands		Small sawtimber stands		Pole-timber stands		Other stand sizes		All stands	
	Sound trees	Cull trees	Sound trees	Cull trees	Sound trees	Cull trees	Sound trees	Cull trees	Sound trees	Cull trees
Loblolly pine										
Softwood	16.0	0.4	19.4	0.4	8.2	0.5	0.6	0.5	14.3	0.4
Hardwood	6.2	0.9	3.7	0.4	1.0	0.3	0.2	0.2	3.0	0.4
Shortleaf pine										
Softwood	13.0	(2/)	15.7	0.6	6.4	0.7	0.4	0.1	8.8	0.6
Hardwood	4.2	0.7	2.9	0.6	1.2	0.5	0.1	0.1	1.7	0.5
Virginia pine										
Softwood	11.0	0.7	16.0	1.5	7.9	1.9	0.2	0.6	7.4	1.5
Hardwood	6.5	1.2	4.1	0.6	1.3	0.4	0.2	0.1	1.6	0.4
White pine										
Softwood	18.6	0.8	12.5	0.2	1.9	0.5	0.6	0.4	11.2	0.5
Hardwood	6.4	2.1	1.6	2.5	2.7	1.0	--	2.0	3.5	2.0
All pine types										
Softwood	15.8	0.4	17.7	0.6	7.4	1.1	0.3	0.5	10.5	0.8
Hardwood	5.9	1.0	3.5	0.5	1.2	0.4	0.2	0.2	2.2	0.4
Oak-pine										
Softwood	7.1	0.3	6.0	0.2	2.5	0.3	0.3	0.3	3.8	0.3
Hardwood	14.8	1.8	10.4	1.1	4.0	1.2	0.2	0.7	6.7	1.2
Oak-hickory										
Softwood	0.8	(2/)	0.9	(2/)	0.4	0.1	0.1	0.1	0.6	0.1
Hardwood	16.1	3.2	13.7	2.0	6.6	2.4	1.0	1.8	9.7	2.4
Maple-beech-birch										
Softwood	0.4	--	--	--	--	--	--	--	0.2	--
Hardwood	10.3	4.1	9.6	4.5	5.7	6.6	1.0	2.4	8.3	4.9
Oak-gum-cypress										
Softwood	1.5	0.3	1.3	(2/)	0.2	--	0.1	--	1.0	0.1
Hardwood	20.6	3.4	17.7	3.6	8.0	2.4	0.6	0.9	14.1	2.9
All hdwd. types[3]										
Softwood	0.9	0.1	0.9	(2/)	0.4	0.1	0.1	0.1	0.6	0.1
Hardwood	16.8	3.2	14.1	2.2	6.7	2.4	0.9	1.7	10.2	2.4
All types										
Softwood	3.0	0.1	7.5	0.3	2.7	0.4	0.2	0.2	3.8	0.3
Hardwood	15.4	2.9	9.9	1.5	4.8	1.7	0.6	1.1	7.5	1.7

1/ Sound wood and bark.
2/ Less than 0.05 cord per acre.
3/ Oak-pine type not included.

Table 27.--Number of trees[1/] by species group, diameter class, and quality

(In thousand trees)

SOUND TREES

D.b.h. class	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All trees
2	812,276	158,281	1,037,875	1,946,874	3,955,306
4	441,992	55,909	291,111	716,341	1,505,353
6	288,087	15,136	121,983	295,648	720,854
8	157,678	9,789	70,863	171,296	409,626
10	73,667	3,335	41,890	104,614	223,506
12	37,807	2,469	25,819	61,197	127,292
14	16,584	1,211	15,662	37,707	71,164
16	6,361	896	7,815	18,196	33,268
18	2,658	443	4,382	9,971	17,454
20	1,168	379	2,176	4,642	8,365
22	563	136	839	2,432	3,970
24	105	102	464	1,279	1,950
26	23	30	224	935	1,212
28	--	31	148	393	572
30+	20	104	108	866	1,098
Total	1,838,989	248,251	1,621,359	3,372,391	7,080,990

SOUND CULLS

2	132,384	17,446	571,057	1,566,192	2,287,079
4	42,405	4,450	90,499	343,817	481,171
6	30,581	1,872	35,572	105,888	173,913
8	15,670	1,044	19,546	47,836	84,096
10	10,947	327	10,903	24,586	46,763
12	4,332	273	5,704	14,469	24,778
14	1,144	145	3,230	8,178	12,697
16	510	27	1,717	5,581	7,835
18	118	38	976	3,475	4,607
20	70	19	804	2,153	3,046
22	19	23	277	1,623	1,942
24	--	--	158	881	1,039
26	--	6	121	410	537
28	--	24	39	358	421
30+	--	18	192	324	534
Total	238,180	25,712	740,795	2,125,771	3,130,458

ROTTEN CULLS

2	--	--	--	--	--
4	--	--	--	--	--
6	852	--	3,355	10,611	14,818
8	348	236	2,017	5,896	8,497
10	132	19	1,554	3,702	5,407
12	32	18	549	1,551	2,150
14	24	--	589	835	1,448
16	61	19	337	801	1,218
18	--	--	301	846	1,147
20	--	4	164	487	655
22	--	5	111	476	592
24	--	--	127	294	421
26	--	--	45	190	235
28	--	--	79	131	210
30+	20	18	161	197	396
Total	1,469	319	9,389	26,017	37,194

1/ All trees 1.0 inch d.b.h. and larger.

Table 28.--Area[1/] of poorly stocked stands by plantability class

(In thousand acres)

Forest type	No planting required	Suitable for machine planting	Hand planting required	All classes
Loblolly pine	568.4	12.1	--	580.5
Shortleaf pine	753.1	7.3	38.4	798.8
Virginia pine	1,067.2	--	61.8	1,129.0
White pine	37.6	--	--	37.6
Oak-pine	777.3	3.0	16.6	796.9
Oak-hickory	4,132.4	11.9	150.3	4,294.6
Maple-beech-birch	12.5	--	5.1	17.6
All types	7,348.5	34.3	272.2	7,655.0

1/ Excludes 428,800 acres on which planting would be impractical because of existing dense cover of brush.

Table 29.--Stocking on commercial forest area by forest type and tree-size class

(In thousand acres)

GROWING STOCK OF ALL SIZES

Forest type	Non-stocked 0-9%	Poor stocking 10-39%	Medium stocking 40-69%	Good stocking 70-100%	Total area
Loblolly pine	13.3	33.1	154.1	1,465.9	1,666.4
Shortleaf pine	4.1	128.3	244.1	900.7	1,277.2
Virginia pine	21.0	143.7	292.9	983.7	1,441.3
White pine	4.0	8.2	19.6	86.2	118.0
Oak-pine	7.4	101.0	258.3	1,039.8	1,406.5
Oak-hickory	117.1	945.4	2,424.1	5,066.3	8,552.9
Maple-beech-birch	1.0	7.1	11.1	32.8	52.0
Oak-gum-cypress	31.8	105.1	234.7	564.0	935.6
All types	199.7	1,471.9	3,638.9	10,139.4	15,449.9
Percent	1.3	9.5	23.6	65.6	100.0

SAWTIMBER GROWING STOCK

Loblolly pine	399.2	525.7	381.9	359.6	1,666.4
Shortleaf pine	539.4	532.4	131.5	73.9	1,277.2
Virginia pine	970.9	333.4	109.8	27.2	1,441.3
White pine	33.0	41.0	24.6	19.4	118.0
Oak-pine	567.6	600.2	181.7	57.0	1,406.5
Oak-hickory	3,207.9	3,943.2	1,191.9	209.9	8,552.9
Maple-beech-birch	17.7	29.1	5.2	--	52.0
Oak-gum-cypress	244.2	370.3	187.4	133.7	935.6
All types	5,979.9	6,375.3	2,214.0	880.7	15,449.9
Percent	38.7	41.3	14.3	5.7	100.0

Table 30.--Net annual growth by species group and unit of measure, 1956

Species group	Sawtimber	Growing stock	
	Million bd.-ft.	Million cu. ft.	Thousand cords
Yellow pines	722.3	212.8	3,284
Other softwoods	42.5	10.0	130
Soft hardwoods	386.1	120.9	1,813
Hard hardwoods	561.7	205.2	3,111
All species	1,712.6	548.9	8,338

Table 31.--Net annual growth percentages by species group and unit of measure, 1956

Unit of measure	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
Board-feet	6.59	3.40	5.23	3.60	4.86
Cubic feet	5.49	3.26	4.75	3.44	4.32
Standard cords	6.02	3.55	5.23	3.81	4.78

Table 32.--Average annual change in volume per acre by stand size and forest type, 1956

Stand size and forest type	Sawtimber (In board-feet)				Growing stock (In standard cords)			
	Growth	Mortality	Timber cut[1]	Net change	Growth	Mortality	Timber cut[1]	Net change
Sawtimber stands:								
Yellow pine	346	26	319	1	1.13	0.15	1.19	-0.21
White pine	286	81	372	-167	.82	.14	.83	- .15
Oak-pine	232	33	166	33	.83	.11	.57	.15
Oak-hickory[2]	167	37	137	-7	.57	.13	.40	.04
Oak-gum-cypress	218	43	76	99	.77	.14	.18	.45
All types	224	34	182	8	.76	.14	.59	.03
Poletimber stands:								
Yellow pine	53	5	15	33	.89	.05	.22	.62
White pine	39	--	--	39	.55	--	--	.55
Oak-pine	50	15	5	30	.50	.09	.06	.35
Oak-hickory[2]	49	7	10	32	.46	.04	.05	.37
Oak-gum-cypress	58	14	7	37	.65	.09	.02	.54
All types	51	8	11	32	.60	.05	.10	.45
Other stands:								
Yellow pine	2	13	5	-16	.05	.05	.02	-.02
White pine	--	--	--	--	.04	--	--	.04
Oak-pine	5	8	--	-3	.06	.02	--	.04
Oak-hickory[2]	20	5	3	12	.07	.07	.01	-.01
Oak-gum-cypress	4	9	--	-5	.08	.06	--	.02
All types	11	9	3	-1	.07	.05	.01	.01
All stands:								
Yellow pine	165	16	135	14	.86	.09	.58	.19
White pine	200	53	242	-95	.69	.09	.54	.06
Oak-pine	121	20	70	31	.59	.08	.26	.25
Oak-hickory[2]	100	19	66	15	.47	.08	.20	.19
Oak-gum-cypress	149	28	49	72	.64	.11	.12	.41
All types	124	19	86	19	.60	.09	.30	.21

1/ Excludes timber removed in clearing land.
2/ Includes volume in maple-beech-birch type.

Table 33.--Average annual volume of timber cut by tree-size class and species group, 1956

Tree size class	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
SAWTIMBER (In million board-feet)					
Small sawtimber	451.9	11.4	49.8	164.2	677.3
Large sawtimber	220.8	36.4	147.4	423.0	827.6
All trees	672.7	47.8	197.2	587.2	1,504.9
GROWING STOCK (In thousand cords)					
Pole trees	1,105	7	152	389	1,653
Small sawtimber	1,326	29	162	524	2,041
Large sawtimber	482	67	345	1,058	1,952
All trees	2,913	103	659	1,971	5,646
GROWING STOCK (In million cubic feet)					
Pole trees	62.8	0.6	9.5	24.1	97.0
Small sawtimber	99.3	2.6	12.2	40.0	154.1
Large sawtimber	40.3	6.3	28.3	86.2	161.1
All trees	202.4	9.5	50.0	150.3	412.2

Table 34.--Net annual change in volume by species group, 1956

SAWTIMBER (In million board-feet)

Item	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
Net volume, beginning of year	10,953.9	1,251.3	7,382.6	15,621.3	35,209.1
Total growth	791.5	51.2	422.8	703.0	1,968.5
Mortality	69.2	8.7	36.7	141.3	255.9
Net growth	722.3	42.5	386.1	561.7	1,712.6
Timber cut	672.7	47.8	197.2	587.2	1,504.9
Loss or gain	+49.6	-5.3	+188.9	-25.5	+207.7
Net volume, end of year	11,003.5	1,246.0	7,571.5	15,595.8	35,416.8
Percent change	+0.5	-0.4	+2.6	-0.2	+0.6

GROWING STOCK (In thousand cords)

Net volume, beginning of year	54,544	3,661	34,698	81,576	174,479
Total growth	3,711	155	1,984	3,700	9,550
Mortality	427	25	171	589	1,212
Net growth	3,284	130	1,813	3,111	8,338
Timber cut	2,913	103	659	1,971	5,646
Loss or gain	+371	+27	+1,154	+1,140	+2,692
Net volume, end of year	54,915	3,688	35,852	82,716	177,171
Percent change	+0.7	+0.7	+3.3	+1.4	+1.5

GROWING STOCK (In million cubic feet)

Net volume, beginning of year	3,879.5	306.5	2,547.2	5,969.8	12,703.0
Total growth	242.7	12.0	133.5	249.0	637.2
Mortality	29.9	2.0	12.6	43.8	88.3
Net growth	212.8	10.0	120.9	205.2	548.9
Timber cut	202.4	9.5	50.0	150.3	412.2
Loss or gain	+10.4	+0.5	+70.9	+54.9	+136.7
Net volume, end of year	3,889.9	307.0	2,618.1	6,024.7	12,839.7
Percent change	+0.3	+0.2	+2.8	+0.9	+1.1

Table 35.--County area by broad use class

County	Total area[1]	Nonforest area		Forest land		
		Land	Water	Non-commercial	Commercial	
	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Percent
Accomack	385.3	179.5	94.5	(2/)	111.3	38.3
Albemarle	476.8	180.7	0.7	14.1	281.3	59.1
Alleghany	288.6	37.5	0.6	30.4	220.1	76.4
Amelia	234.2	69.6	--	0.1	164.5	70.2
Amherst	300.8	76.2	3.6	0.5	220.5	74.2
Appomattox	220.8	63.1	1.8	0.6	155.3	70.9
Augusta	631.0	278.5	0.1	63.0	289.4	45.9
Bath	345.6	42.0	0.8	46.7	256.1	74.3
Bedford	499.8	189.5	1.0	5.1	304.2	61.0
Bland	236.2	64.3	--	5.8	166.1	70.3
Botetourt	351.4	96.5	0.8	26.7	227.4	64.9
Brunswick	370.6	103.1	0.7	--	266.8	72.1
Buchanan	325.1	47.8	--	--	277.3	85.3
Buckingham	372.5	71.2	5.8	--	295.5	80.6
Campbell	343.7	122.1	1.3	(2/)	220.3	64.3
Caroline	351.4	74.1	3.5	25.0	248.8	71.5
Carroll	318.7	159.4	2.2	6.0	151.1	47.7
Charles City	130.6	29.1	14.2	--	87.3	75.0
Charlotte	301.4	88.5	2.7	--	210.2	70.4
Chesterfield	303.4	67.9	8.1	2.0	225.4	76.3
Clarke	111.3	75.2	0.9	--	35.2	31.9
Craig	215.0	42.8	--	13.2	159.0	74.0
Culpeper	248.9	133.1	--	--	115.8	46.5
Cumberland	186.9	51.5	0.7	--	134.7	72.3
Dickenson	214.4	27.3	--	1.4	185.7	86.6
Dinwiddie	324.5	91.6	0.3	4.6	228.0	70.3
Essex	169.0	53.5	10.0	--	105.5	66.4
Fairfax	270.7	118.7	6.7	1.1	144.2	54.6
Fauquier	422.4	255.9	--	2.0	164.5	38.9
Floyd	245.1	133.5	--	2.4	109.2	44.6
Fluvanna	184.3	59.1	4.5	--	120.7	67.1
Franklin	461.5	168.4	2.1	0.9	290.1	63.1
Frederick	276.5	130.5	0.2	1.8	144.0	52.1
Giles	232.3	64.3	2.2	8.3	157.5	68.4
Gloucester	164.5	44.1	24.3	(2/)	96.1	68.5
Goochland	188.8	51.3	5.2	--	132.3	72.1
Grayson	291.2	150.6	1.9	5.4	133.3	46.1
Greene	97.9	35.7	--	13.8	48.4	49.4
Greensville	193.3	52.7	1.2	(2/)	139.4	72.6
Halifax	517.1	190.0	4.9	1.1	321.1	62.7
Hanover	301.4	91.3	0.5	0.2	209.4	69.6
Henrico	149.8	67.8	2.6	0.5	78.9	53.6
Henry	246.4	80.4	5.5	1.7	158.8	65.9
Highland	266.3	69.9	--	9.7	186.7	70.1
Isle of Wight	230.4	84.3	26.7	0.2	119.2	58.5
James City	116.5	26.6	22.3	1.8	65.8	69.9
King and Queen	209.3	46.2	6.7	--	156.4	77.2
King George	117.1	38.7	4.1	--	74.3	65.8
King William	183.0	44.7	7.0	--	131.3	74.6
Lancaster	97.9	32.0	9.5	--	56.4	63.8
Lee	280.3	136.3	0.1	16.1	127.8	45.6
Loudoun	330.9	232.4	0.1	0.2	98.2	29.7

Table 35.--County area by broad use class (continued)

County	Total area[1]	Nonforest area		Forest land		
		Land	Water	Non-commercial	Commercial	
	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Percent
Louisa	330.9	102.1	0.5	--	228.3	69.1
Lunenburg	283.5	82.8	--	--	200.7	70.8
Madison	209.3	89.6	--	32.4	87.3	41.7
Mathews	67.2	22.7	15.0	--	29.5	56.5
Mecklenburg	432.0	160.0	37.8	0.1	234.1	59.4
Middlesex	88.3	28.9	5.6	--	53.8	65.1
Montgomery	252.8	96.0	0.5	2.9	153.4	60.8
Nansemond	273.9	90.0	20.0	0.8	163.1	64.2
Nelson	301.4	79.3	1.1	1.2	219.8	73.2
New Kent	141.4	25.7	6.5	--	109.2	80.9
Norfolk	254.7	87.1	26.9	0.2	140.5	61.7
Northampton	228.5	101.1	89.3	--	38.1	27.4
Northumberland	142.7	46.1	21.6	--	75.0	61.9
Nottoway	197.1	53.9	0.3	0.7	142.2	72.3
Orange	227.2	84.1	--	0.2	142.9	62.9
Page	202.2	72.7	0.6	46.8	82.1	40.7
Patrick	300.2	80.8	1.7	6.3	211.4	70.8
Pittsylvania	654.1	246.1	1.6	0.1	406.3	62.3
Powhatan	174.1	38.9	3.8	--	131.4	77.2
Prince Edward	228.5	62.0	--	(2/)	166.5	72.9
Prince George	190.7	53.8	13.7	4.6	118.6	67.0
Prince William	226.6	85.9	4.9	17.8	118.0	53.2
Princess Anne	207.4	100.0	42.9	3.6	60.9	37.0
Pulaski	217.6	95.7	9.7	6.3	105.9	50.9
Rappahannock	170.9	74.4	--	31.7	64.8	37.9
Richmond	129.9	45.0	8.1	--	76.8	63.1
Roanoke	176.6	67.7	--	2.6	106.3	60.2
Rockbridge	386.6	133.4	0.6	27.4	225.2	58.3
Rockingham	556.2	246.9	1.9	78.0	229.4	41.4
Russell	309.1	165.1	0.7	--	143.3	46.5
Scott	345.0	151.1	1.2	5.0	187.7	54.6
Shenandoah	324.5	138.2	0.5	18.3	167.5	51.7
Smyth	278.4	115.8	0.1	4.0	158.5	57.0
Southampton	388.5	132.7	1.1	--	254.7	65.7
Spotsylvania	265.6	71.3	0.8	1.9	191.6	72.4
Stafford	177.3	41.5	4.3	17.6	113.9	65.8
Surry	195.8	43.7	16.9	--	135.2	75.6
Sussex	317.4	66.7	0.6	--	250.1	78.9
Tazewell	334.1	144.8	--	0.3	189.0	56.6
Warren	140.2	55.5	1.1	14.0	69.6	50.0
Washington	370.6	197.3	2.4	0.5	170.4	46.3
Westmoreland	160.0	58.5	11.3	1.4	88.8	59.7
Wise	265.6	64.1	0.4	13.5	187.6	70.7
Wythe	294.4	144.9	1.3	7.0	141.2	48.2
York[3]	215.0	81.4	57.1	4.0	72.5	45.9
State total	25,966.8	9,146.3	707.0	663.6	15,449.9	61.2

1/ Gross area from the Bureau of the Census, 1950. Excludes Arlington County and all independent cities except Hampton and Warwick.

2/ Less than 50 acres.

3/ Includes area in independent cities Hampton and Warwick.

Table 36.--Ownership of commercial forest land by county

County	Private		Public					
			National forest	Other Federal	State	County, city, town	Total public	
	Thousand acres	Percent	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Percent
Accomack	108.9	97.8	--	2.4	--	--	2.4	2.2
Albemarle	279.6	99.4	--	--	0.2	1.5	1.7	0.6
Alleghany	116.6	53.0	101.3	--	--	2.2	103.5	47.0
Amelia	164.5	100.0	--	--	--	--	--	--
Amherst	166.5	75.5	53.2	--	0.5	0.3	54.0	24.5
Appomattox	146.2	94.1	--	--	9.1	--	9.1	5.9
Augusta	149.6	51.7	139.5	--	0.1	0.2	139.8	48.3
Bath	128.3	50.1	127.8	--	--	(1/)	127.8	49.9
Bedford	288.1	94.7	14.5	--	--	1.6	16.1	5.3
Bland	146.5	88.2	19.0	--	0.6	--	19.6	11.8
Botetourt	163.0	71.7	52.7	--	--	11.7	64.4	28.3
Brunswick	257.5	96.5	--	5.7	3.5	0.1	9.3	3.5
Buchanan	277.3	100.0	--	--	--	(1/)	(1/)	--
Buckingham	283.0	95.8	2.7	--	9.8	--	12.5	4.2
Campbell	220.1	99.9	--	--	--	0.2	0.2	0.1
Caroline	210.7	84.7	--	37.7	0.1	0.3	38.1	15.3
Carroll	146.0	96.6	4.3	--	--	0.8	5.1	3.4
Charles City	87.2	99.9	--	(1/)	--	0.1	0.1	0.1
Charlotte	208.6	99.2	--	1.6	--	--	1.6	0.8
Chesterfield	218.7	97.0	--	0.9	5.8	--	6.7	3.0
Clarke	35.0	99.4	--	(1/)	(1/)	0.2	0.2	0.6
Craig	60.2	37.9	98.8	--	--	(1/)	98.8	62.1
Culpeper	115.8	100.0	--	--	--	--	--	--
Cumberland	119.3	88.6	--	--	15.4	--	15.4	11.4
Dickenson	177.1	95.4	8.6	--	--	--	8.6	4.6
Dinwiddie	219.3	96.2	--	8.4	0.3	--	8.7	3.8
Essex	105.5	100.0	--	--	--	--	--	--
Fairfax	138.0	95.7	--	6.2	--	--	6.2	4.3
Fauquier	163.3	99.3	--	1.2	--	--	1.2	0.7
Floyd	109.2	100.0	--	--	(1/)	--	(1/)	--
Fluvanna	120.7	100.0	--	--	(1/)	--	(1/)	--
Franklin	287.4	99.1	--	2.7	--	--	2.7	0.9
Frederick	141.3	98.1	2.7	--	--	(1/)	2.7	1.9
Giles	108.1	68.6	48.2	--	1.2	(1/)	49.4	31.4
Gloucester	96.1	100.0	--	--	--	--	--	--
Goochland	132.2	99.9	--	--	0.1	(1/)	0.1	0.1
Grayson	121.6	91.2	11.6	--	--	0.1	11.7	8.8
Greene	48.4	100.0	--	--	--	--	--	--
Greensville	139.3	99.9	--	--	0.1	--	0.1	0.1
Halifax	311.6	97.0	--	9.4	0.1	--	9.5	3.0
Hanover	208.2	99.4	--	--	1.2	(1/)	1.2	0.6
Henrico	77.9	98.7	--	--	--	1.0	1.0	1.3
Henry	157.8	99.4	--	0.9	--	0.1	1.0	0.6
Highland	139.1	74.5	47.6	--	--	--	47.6	25.5
Isle of Wight	119.2	100.0	--	--	--	(1/)	(1/)	--
James City	64.0	97.3	--	1.0	0.7	0.1	1.8	2.7
King and Queen	156.0	99.7	--	--	--	0.4	0.4	0.3
King George	73.4	98.8	--	0.9	--	--	0.9	1.2
King William	130.7	99.5	--	--	0.6	--	0.6	0.5
Lancaster	56.4	100.0	--	--	--	--	--	--

Table 36.--Ownership of commercial forest land by county (continued)

County	Private		Public					
			National forest	Other Federal	State	County, city, town	Total public	
	Thousand acres	Percent	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Thousand acres	Percent
Lee	118.7	92.9	9.0	--	--	0.1	9.1	7.1
Loudoun	98.2	100.0	--	--	--	--	--	--
Louisa	228.3	100.0	--	--	--	--	--	--
Lunenburg	200.6	100.0	--	0.1	--	--	0.1	(1/)
Madison	87.3	100.0	--	--	--	--	--	--
Mathews	29.5	100.0	--	--	--	--	--	--
Mecklenburg	208.8	89.2	--	24.7	0.3	0.3	25.3	10.8
Middlesex	53.8	100.0	--	--	--	--	--	--
Montgomery	135.6	88.4	14.8	0.8	2.2	(1/)	17.8	11.6
Nansemond	161.4	99.0	--	0.1	--	1.6	1.7	1.0
Nelson	205.7	93.6	12.9	--	(1/)	1.2	14.1	6.4
New Kent	108.4	99.3	--	--	0.8	--	0.8	0.7
Norfolk	136.7	97.3	--	3.8	--	--	3.8	2.7
Northampton	37.8	99.2	--	0.3	--	--	0.3	0.8
Northumberland	75.0	100.0	--	--	--	--	--	--
Nottoway	124.8	87.8	--	17.3	0.1	--	17.4	12.2
Orange	142.9	100.0	--	--	--	--	--	--
Page	64.2	78.2	17.9	--	--	--	17.9	21.8
Patrick	203.7	96.4	--	2.7	--	5.0	7.7	3.6
Pittsylvania	405.8	99.9	--	--	(1/)	0.5	0.5	0.1
Powhatan	129.5	98.6	--	--	1.9	--	1.9	1.4
Prince Edward	159.7	95.9	--	--	6.8	--	6.8	4.1
Prince George	115.5	97.4	--	3.1	--	--	3.1	2.6
Prince William	98.4	83.4	--	19.2	0.4	--	19.6	16.6
Princess Anne	58.2	95.6	--	1.6	0.9	0.2	2.7	4.4
Pulaski	73.6	69.5	16.9	0.2	15.0	0.2	32.3	30.5
Rappahannock	64.8	100.0	--	--	--	--	--	--
Richmond	76.8	100.0	--	--	--	--	--	--
Roanoke	96.2	90.5	1.6	0.1	6.8	1.6	10.1	9.5
Rockbridge	173.1	76.9	46.1	--	0.3	5.7	52.1	23.1
Rockingham	126.3	55.1	101.4	--	--	1.7	103.1	44.9
Russell	143.2	99.9	--	--	(1/)	0.1	0.1	0.1
Scott	157.4	83.9	30.3	--	--	--	30.3	16.1
Shenandoah	110.0	65.7	57.5	--	--	(1/)	57.5	34.3
Smyth	99.2	62.6	59.1	--	0.1	0.1	59.3	37.4
Southampton	252.8	99.3	--	--	1.9	--	1.9	0.7
Spotsylvania	191.6	100.0	--	--	--	--	--	--
Stafford	99.3	87.2	--	14.5	--	0.1	14.6	12.8
Surry	135.2	100.0	--	--	--	--	--	--
Sussex	249.7	99.8	--	--	0.3	0.1	0.4	0.2
Tazewell	184.0	97.4	5.0	--	--	(1/)	5.0	2.6
Warren	63.7	91.5	4.2	1.7	--	--	5.9	8.5
Washington	153.9	90.3	16.2	0.3	(1/)	(1/)	16.5	9.7
Westmoreland	88.8	100.0	--	--	--	--	--	--
Wise	159.1	84.8	26.9	--	--	1.6	28.5	15.2
Wythe	94.0	66.6	45.3	--	(1/)	1.9	47.2	33.4
York	42.5	58.6	--	21.1	(1/)	8.9	30.0	41.4
State total	13,922.7	90.1	1,197.6	190.6	87.2	51.8	1,527.2	9.9

1/ Less than 50 acres, or 0.05 percent.

Table 37.--Net volume[1] of sawtimber by county and species group

(In million board-feet)

County	Softwoods[2]	Gum, yellow-poplar, and soft maple[3]	Oaks and other hard hardwoods	All species
Accomack	228.2	59.9	8.8	296.9
Albemarle	100.3	120.5	292.9	513.7
Alleghany	42.1	1.7	167.8	211.6
Amelia	235.9	132.3	131.1	499.3
Amherst	57.7	49.0	219.0	325.7
Appomattox	80.6	56.0	127.7	264.3
Augusta	57.8	17.3	356.7	431.8
Bath	77.3	14.1	303.2	394.6
Bedford	98.2	86.0	198.6	382.8
Bland	36.8	19.6	153.7	210.1
Botetourt	115.6	124.0	281.3	520.9
Brunswick	413.7	105.8	105.2	624.7
Buchanan	16.2	205.7	240.5	462.4
Buckingham	107.8	56.4	252.6	416.8
Campbell	59.7	54.1	182.7	296.5
Caroline	341.4	211.3	267.5	820.2
Carroll	105.7	21.8	168.5	296.0
Charles City	245.3	38.2	108.5	392.0
Charlotte	98.3	127.4	180.2	405.9
Chesterfield	423.2	91.3	274.4	788.9
Clarke	9.5	28.5	25.5	63.5
Craig	55.9	30.9	132.8	219.6
Culpeper	76.7	34.6	113.0	224.3
Cumberland	76.2	13.7	176.1	266.0
Dickenson	7.7	141.9	258.0	407.6
Dinwiddie	513.2	95.0	204.3	812.5
Essex	177.4	56.9	101.5	335.8
Fairfax	77.6	92.7	295.5	465.8
Fauquier	38.4	42.7	198.0	279.1
Floyd	49.3	36.0	75.6	160.9
Fluvanna	54.0	64.6	97.8	216.4
Franklin	159.3	93.5	184.3	437.1
Frederick	24.2	19.0	208.4	251.6
Giles	12.1	26.7	168.9	207.7
Gloucester	242.1	136.2	171.5	549.8
Goochland	19.1	80.4	117.4	216.9
Grayson	14.9	16.7	159.7	191.3
Greene	16.7	20.2	71.4	108.3
Greensville	254.1	112.1	150.2	516.4
Halifax	233.2	165.9	224.2	623.3
Hanover	289.0	264.0	279.4	832.4
Henrico	59.1	53.7	90.0	202.8
Henry	57.7	31.9	51.5	141.1
Highland	87.2	33.6	293.6	414.4
Isle of Wight	341.2	95.8	179.6	616.6
James City	70.3	37.7	119.7	227.7
King and Queen	255.8	65.4	201.6	522.8
King George	54.5	48.4	107.7	210.6
King William	272.1	66.9	171.1	510.1
Lancaster	75.2	24.1	43.8	143.1
Lee	19.1	42.0	113.3	174.4

Table 37.--Net volume[1] of sawtimber by county and species group (continued)

(In million board-feet)

County	Softwoods[2]	Gum, yellow-poplar, and soft maple[3]	Oaks and other hard hardwoods	All species
Loudoun	13.6	53.3	272.6	339.5
Louisa	106.0	71.3	192.0	369.3
Lunenburg	156.4	94.7	95.9	347.0
Madison	19.6	29.2	128.4	177.2
Mathews	63.2	22.6	15.7	101.5
Mecklenburg	137.8	130.3	174.8	442.9
Middlesex	81.5	47.7	50.2	179.4
Montgomery	34.7	26.8	110.1	171.6
Nansemond	305.2	311.5	133.2	749.9
Nelson	31.2	115.0	199.8	346.0
New Kent	130.7	103.7	134.7	369.1
Norfolk	193.7	158.5	88.6	440.8
Northampton	152.0	8.4	17.2	177.6
Northumberland	118.9	29.5	60.1	208.5
Nottoway	127.7	58.7	77.1	263.5
Orange	58.9	73.6	157.0	289.5
Page	26.5	10.6	94.5	131.6
Patrick	80.3	73.7	118.2	272.2
Pittsylvania	264.3	198.5	354.9	817.7
Powhatan	75.0	66.4	131.6	273.0
Prince Edward	48.9	67.6	82.2	198.7
Prince George	199.0	43.8	115.0	357.8
Prince William	85.6	38.3	207.2	331.1
Princess Anne	78.2	60.3	42.3	180.8
Pulaski	59.5	13.8	26.5	99.8
Rappahannock	5.0	44.5	117.8	167.3
Richmond	71.7	57.6	102.2	231.5
Roanoke	41.9	17.4	47.2	106.5
Rockbridge	120.4	137.2	357.2	614.8
Rockingham	234.1	52.3	371.9	658.3
Russell	4.0	85.7	156.1	245.8
Scott	46.2	86.9	132.2	265.3
Shenandoah	41.1	25.8	217.1	284.0
Smyth	39.6	46.3	165.7	251.6
Southampton	707.9	352.3	263.3	1,323.5
Spotsylvania	74.2	95.9	121.4	291.5
Stafford	30.4	26.6	166.8	223.8
Surry	330.5	83.3	137.9	551.7
Sussex	667.5	208.0	285.8	1,161.3
Tazewell	6.5	44.0	220.5	271.0
Warren	3.7	29.2	47.0	79.9
Washington	76.7	82.1	192.6	351.4
Westmoreland	81.5	41.7	119.7	242.9
Wise	78.3	185.8	266.0	530.1
Wythe	45.0	18.0	132.6	195.6
York	216.0	90.1	114.2	420.3
State total	12,205.2	7,382.6	15,621.3	35,209.1

1/ Log scale, International 1/4-inch rule.
2/ Includes white pine, hemlock, redcedar, whitecedar, and cypress.
3/ Includes other soft hardwoods.

Table 38.--Net volume[1/] of sawtimber by county, broad species group, and diameter group

(In million board-feet)

County	Softwoods			Hardwoods		
	9.0-14.9 inches	15.0-18.9 inches	19.0+ inches	11.0-14.9 inches	15.0-18.9 inches	19.0+ inches
Accomack	153.7	48.8	25.7	27.0	31.3	10.4
Albemarle	84.8	8.5	7.0	213.0	120.0	80.4
Alleghany	37.9	4.2	--	61.4	64.4	43.7
Amelia	168.9	54.9	12.1	136.7	54.5	72.2
Amherst	47.4	10.3	--	136.0	59.3	72.7
Appomattox	80.6	--	--	109.5	38.2	36.0
Augusta	43.8	--	14.0	201.0	90.1	82.9
Bath	36.8	9.4	31.1	132.3	109.6	75.4
Bedford	78.4	19.8	--	153.2	53.3	78.1
Bland	22.7	6.5	7.6	91.1	42.5	39.7
Botetourt	51.7	45.8	18.1	188.6	119.2	97.5
Brunswick	353.0	42.9	17.8	133.3	43.2	34.5
Buchanan	6.4	3.2	6.6	188.5	135.1	122.6
Buckingham	91.8	3.4	12.6	181.5	82.6	44.9
Campbell	56.1	3.6	--	141.9	60.2	34.7
Caroline	253.2	82.0	6.2	209.5	134.5	134.8
Carroll	43.5	11.3	50.9	101.0	56.5	32.8
Charles City	175.6	42.7	27.0	82.5	49.0	15.2
Charlotte	98.3	--	--	157.9	69.7	80.0
Chesterfield	262.5	78.0	82.7	177.6	93.7	94.4
Clarke	0.8	1.3	7.4	29.0	14.2	10.8
Craig	37.1	13.8	5.0	88.3	47.3	28.1
Culpeper	70.2	6.5	--	66.1	47.2	34.3
Cumberland	69.1	7.1	--	69.4	21.2	99.2
Dickenson	4.6	3.1	--	136.1	124.9	138.9
Dinwiddie	360.9	120.8	31.5	165.0	86.0	48.3
Essex	118.1	53.8	5.5	85.2	51.0	22.2
Fairfax	70.0	7.6	--	160.7	155.1	72.4
Fauquier	38.4	--	--	96.1	80.3	64.3
Floyd	49.3	--	--	65.3	29.4	16.9
Fluvanna	54.0	--	--	84.7	40.2	37.5
Franklin	125.0	17.6	16.7	165.6	64.5	47.7
Frederick	24.2	--	--	93.2	54.5	79.7
Giles	12.1	--	--	101.5	57.1	37.0
Gloucester	143.8	64.8	33.5	96.6	90.2	120.9
Goochland	15.9	3.2	--	112.4	48.8	36.6
Grayson	14.9	--	--	95.6	70.1	10.7
Greene	15.2	1.5	--	37.5	41.8	12.3
Greensville	201.5	52.6	--	110.5	72.5	79.3
Halifax	188.2	14.6	30.4	218.0	114.7	57.4
Hanover	259.9	21.8	7.3	162.9	168.1	212.4
Henrico	44.5	14.6	--	86.3	43.1	14.3
Henry	42.4	15.3	--	53.0	30.4	--
Highland	46.1	35.1	6.0	175.2	105.1	46.9
Isle of Wight	206.2	108.8	26.2	82.5	67.5	125.4
James City	47.3	12.8	10.2	76.6	63.1	17.7
King and Queen	211.0	38.1	6.7	117.2	101.9	47.9
King George	31.7	10.4	12.4	66.0	39.9	50.2
King William	192.7	33.1	46.3	98.7	80.2	59.1
Lancaster	56.8	15.3	3.1	38.7	21.7	7.5

Table 38.--Net volume[1/] of sawtimber by county, broad species group, and diameter group (continued)

(In million board-feet)

County	Softwoods			Hardwoods		
	9.0-14.9 inches	15.0-18.9 inches	19.0+ inches	11.0-14.9 inches	15.0-18.9 inches	19.0+ inches
Lee	19.1	--	--	73.3	52.5	29.5
Loudoun	13.6	--	--	93.7	97.5	134.7
Louisa	102.3	3.7	--	194.7	48.8	19.8
Lunenburg	149.6	6.8	--	129.2	49.2	12.2
Madison	19.6	--	--	52.2	40.9	64.5
Mathews	46.7	13.1	3.4	15.0	10.0	13.3
Mecklenburg	122.8	15.0	--	159.5	104.8	40.8
Middlesex	58.2	10.9	12.4	48.1	26.7	23.1
Montgomery	32.5	2.2	--	63.7	49.3	23.9
Nansemond	176.0	114.5	14.7	163.6	123.5	157.6
Nelson	16.9	14.3	--	126.9	100.8	87.1
New Kent	107.3	23.4	--	103.1	72.8	62.5
Norfolk	127.2	59.2	7.3	131.1	68.7	47.3
Northampton	89.1	35.7	27.2	12.4	4.7	8.5
Northumberland	103.2	7.1	8.6	53.7	20.5	15.4
Nottoway	101.9	19.8	6.0	64.0	38.8	33.0
Orange	55.4	3.5	--	98.9	54.9	76.8
Page	25.1	1.4	--	52.3	33.8	19.0
Patrick	53.5	19.0	7.8	80.6	75.5	35.8
Pittsylvania	190.4	48.7	25.2	207.1	154.0	192.3
Powhatan	65.8	9.2	--	133.0	61.0	4.0
Prince Edward	48.9	--	--	59.2	43.7	46.9
Prince George	137.6	30.2	31.2	97.8	50.1	10.9
Prince William	85.6	--	--	97.1	92.5	55.9
Princess Anne	29.4	33.8	15.0	58.3	38.9	5.4
Pulaski	31.3	18.4	9.8	21.8	13.7	4.8
Rappahannock	2.3	2.7	--	52.6	47.4	62.3
Richmond	46.5	12.4	12.8	73.7	50.0	36.1
Roanoke	30.7	3.4	7.8	25.5	20.6	18.5
Rockbridge	72.2	29.7	18.5	240.2	184.8	69.4
Rockingham	77.6	24.7	131.8	198.6	147.7	77.9
Russell	2.2	1.8	--	94.1	75.9	71.8
Scott	5.9	--	40.3	94.5	77.7	46.9
Shenandoah	35.0	6.1	--	125.1	61.8	56.0
Smyth	24.4	12.0	3.2	106.6	59.2	46.2
Southampton	451.4	156.7	99.8	218.4	231.3	165.9
Spotsylvania	70.8	3.4	--	163.0	37.7	16.6
Stafford	30.4	--	--	90.1	70.1	33.2
Surry	249.5	81.0	--	80.7	76.5	64.0
Sussex	435.3	170.7	61.5	217.1	146.4	130.3
Tazewell	6.5	--	--	95.4	52.6	116.5
Warren	3.7	--	--	52.1	15.4	8.7
Washington	39.4	20.3	17.0	127.1	87.0	60.6
Westmoreland	68.1	8.7	4.7	56.5	54.3	50.6
Wise	2.8	16.2	59.3	149.0	144.5	158.3
Wythe	37.8	7.2	--	73.9	44.6	32.1
York	123.3	54.4	38.3	68.9	61.2	74.2
State total	8,723.8	2,250.2	1,231.2	10,650.8	6,813.2	5,539.9

1/ Log scale, International 1/4-inch rule.

Table 39.--Net volume[1/] of all timber by county, species group, and diameter group

(In thousand cords)

GROWING STOCK

County	Yellow pines		Other softwoods		Soft hardwoods		Hard hardwoods		All species
	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	
Accomack	581	271	--	--	239	130	132	11	1,364
Albemarle	409	65	53	34	241	230	1,184	638	2,854
Alleghany	109	25	23	13	51	--	526	401	1,148
Amelia	788	270	6	--	337	233	520	261	2,415
Amherst	202	34	18	15	51	85	724	468	1,597
Appomattox	520	40	14	--	62	109	585	230	1,560
Augusta	284	34	30	29	57	30	1,376	688	2,528
Bath	150	41	28	55	143	24	1,196	627	2,264
Bedford	721	62	6	--	482	171	726	393	2,561
Bland	76	38	28	11	135	27	526	334	1,175
Botetourt	186	94	34	83	177	222	942	579	2,317
Brunswick	1,808	351	6	--	424	179	397	201	3,366
Buchanan	--	--	7	31	403	427	611	505	1,984
Buckingham	474	84	34	--	236	96	1,410	460	2,794
Campbell	536	9	--	--	200	86	850	341	2,022
Caroline	1,034	427	2	--	244	439	644	540	3,330
Carroll	85	6	135	121	157	36	678	335	1,553
Charles City	650	277	5	9	180	69	278	204	1,672
Charlotte	808	53	12	--	259	267	503	359	2,261
Chesterfield	1,102	599	--	8	433	144	870	549	3,705
Clarke	9	3	--	12	42	60	123	41	290
Craig	215	76	20	--	77	59	515	278	1,240
Culpeper	320	90	5	--	113	68	411	253	1,260
Cumberland	831	57	30	--	117	13	337	353	1,738
Dickenson	19	8	8	--	315	283	484	577	1,694
Dinwiddie	1,304	664	22	--	393	179	774	438	3,774
Essex	527	221	--	--	135	110	293	192	1,478
Fairfax	594	54	--	--	152	189	428	669	2,086
Fauquier	241	16	4	--	143	98	650	378	1,530
Floyd	45	--	206	24	118	66	180	136	775
Fluvanna	315	20	--	--	143	133	398	191	1,200
Franklin	940	51	60	67	360	139	642	367	2,626
Frederick	208	12	12	4	90	43	730	467	1,566
Giles	25	12	--	6	89	33	547	351	1,063
Gloucester	572	356	--	--	222	285	248	384	2,067
Goochland	292	8	6	--	119	184	512	236	1,357
Grayson	2	--	24	14	38	47	610	336	1,071
Greene	74	11	2	3	29	44	129	155	447
Greensville	738	247	7	6	158	229	263	324	1,972
Halifax	1,387	164	31	--	569	298	901	412	3,762
Hanover	1,571	160	4	--	457	573	452	589	3,806
Henrico	305	60	--	--	138	106	261	172	1,042
Henry	848	52	2	--	110	59	286	92	1,449
Highland	135	30	78	83	155	57	1,033	627	2,198
Isle of Wight	724	488	27	--	208	192	168	387	2,194
James City	184	72	--	7	127	79	297	249	1,015
King and Queen	1,072	241	--	--	439	102	418	413	2,685
King George	277	71	5	--	132	96	269	219	1,069
King William	725	343	4	--	191	131	425	367	2,186
Lancaster	323	72	--	--	95	44	176	67	777

Table 39.--Net volume[1/] of all timber by county, species group, and diameter group (continued)

(In thousand cords)

GROWING STOCK

County	Yellow pines		Other softwoods		Soft hardwoods		Hard hardwoods		All species
	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	
Lee	8	--	36	6	144	73	398	244	909
Loudoun	107	--	--	--	39	120	469	625	1,360
Louisa	612	53	19	--	329	113	904	309	2,339
Lunenburg	924	52	14	--	399	144	529	147	2,209
Madison	109	8	--	--	90	55	250	299	811
Mathews	133	74	--	--	43	44	83	25	402
Mecklenburg	1,011	77	12	--	369	248	807	336	2,860
Middlesex	244	71	4	24	121	84	161	101	810
Montgomery	155	22	89	6	110	43	492	247	1,164
Nansemond	389	476	29	35	705	608	270	283	2,795
Nelson	131	27	13	12	353	228	483	439	1,686
New Kent	436	114	--	--	149	203	251	243	1,396
Norfolk	279	264	3	21	454	293	137	177	1,628
Northampton	241	241	--	--	28	19	49	32	610
Northumberland	458	71	--	--	126	39	211	114	1,019
Nottoway	457	145	12	--	212	111	220	161	1,318
Orange	476	50	40	--	94	153	696	278	1,787
Page	136	8	21	6	45	26	396	189	827
Patrick	246	28	20	58	229	136	717	267	1,701
Pittsylvania	1,753	229	38	8	769	376	969	761	4,903
Powhatan	349	26	13	--	191	127	458	245	1,409
Prince Edward	605	6	6	--	130	133	520	156	1,556
Prince George	678	221	--	--	243	84	431	211	1,868
Prince William	522	41	9	--	80	68	674	437	1,831
Princess Anne	67	130	--	3	257	98	120	86	761
Pulaski	156	80	7	11	49	32	227	55	617
Rappahannock	6	6	2	--	114	84	164	277	653
Richmond	282	106	--	--	160	119	298	202	1,167
Roanoke	180	25	36	17	106	32	231	103	730
Rockbridge	194	48	65	107	106	290	931	792	2,533
Rockingham	277	54	88	262	150	106	928	821	2,686
Russell	2	3	6	2	189	159	329	345	1,035
Scott	19	--	28	72	259	172	363	289	1,202
Shenandoah	296	20	3	13	42	50	988	439	1,851
Smyth	90	46	25	8	175	85	580	316	1,325
Southampton	1,128	732	92	224	702	714	554	565	4,711
Spotsylvania	648	32	14	--	395	199	681	207	2,176
Stafford	364	12	--	--	156	41	451	320	1,344
Surry	818	378	23	20	322	160	170	309	2,200
Sussex	1,455	833	16	21	557	388	709	563	4,542
Tazewell	13	10	2	4	215	78	547	479	1,348
Warren	32	5	8	--	74	58	472	70	719
Washington	118	40	39	69	266	145	602	429	1,708
Westmoreland	327	74	--	--	147	74	276	260	1,158
Wise	5	10	15	132	363	375	644	621	2,165
Wythe	129	50	26	12	64	30	588	260	1,159
York	345	352	2	--	180	193	290	242	1,604
State total	42,755	11,789	1,873	1,788	20,485	14,213	49,356	32,220	174,479

1/ Sound wood and bark.

Table 39.--Net volume[1/] of all timber by county, species group, and diameter group (continued)

(In thousand cords)

OTHER MATERIAL

County	Yellow pines		Other softwoods		Soft hardwoods		Hard hardwoods		All species
	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	
Accomack	110	25	--	--	121	36	24	7	323
Albemarle	41	--	--	--	21	40	181	63	346
Alleghany	44	5	--	--	24	35	279	360	747
Amelia	40	4	--	--	60	56	106	12	278
Amherst	87	--	6	--	48	9	240	96	486
Appomattox	56	5	--	--	3	66	49	15	194
Augusta	104	--	20	14	24	61	322	392	937
Bath	26	--	--	7	35	40	482	323	913
Bedford	84	8	2	5	116	50	368	202	835
Bland	31	--	5	4	11	21	93	219	384
Botetourt	25	5	12	5	18	3	151	185	404
Brunswick	--	13	--	--	59	42	48	12	174
Buchanan	2	5	--	--	66	129	322	537	1,061
Buckingham	46	42	--	--	37	8	200	31	364
Campbell	71	4	--	--	15	17	139	47	293
Caroline	83	14	--	--	84	14	123	73	391
Carroll	7	--	8	--	47	18	271	93	444
Charles City	10	3	--	--	25	29	46	20	133
Charlotte	129	25	--	--	28	--	26	59	267
Chesterfield	17	21	--	--	27	36	69	14	184
Clarke	5	2	--	--	10	3	50	21	91
Craig	52	--	--	--	5	27	208	207	499
Culpeper	69	15	--	--	54	31	105	18	292
Cumberland	118	--	2	--	23	--	27	18	188
Dickenson	--	--	--	--	12	58	129	220	419
Dinwiddie	--	22	--	--	23	19	58	21	143
Essex	34	9	--	--	6	3	32	74	158
Fairfax	103	4	--	--	23	38	60	152	380
Fauquier	189	34	--	--	55	8	130	100	516
Floyd	42	--	6	--	90	20	33	147	338
Fluvanna	40	--	--	--	24	87	123	48	322
Franklin	126	9	38	8	160	92	210	149	792
Frederick	23	--	--	--	4	--	89	92	208
Giles	19	6	3	25	72	33	213	219	590
Gloucester	26	6	--	--	43	21	29	10	135
Goochland	48	--	5	--	5	10	72	--	140
Grayson	--	5	--	--	101	35	196	110	447
Greene	9	--	--	--	10	22	27	36	104
Greensville	13	6	--	21	73	13	51	15	192
Halifax	46	10	--	--	66	16	83	30	251
Hanover	36	5	--	--	43	36	39	14	173
Henrico	9	--	--	--	18	26	38	4	95
Henry	166	7	--	4	54	16	210	57	514
Highland	12	--	19	--	36	32	324	301	724
Isle of Wight	14	8	8	--	57	35	38	83	243
James City	--	--	--	--	15	2	24	19	60
King and Queen	47	12	--	--	11	115	12	87	284
King George	28	2	--	--	16	8	17	18	89
King William	8	10	--	--	87	21	39	65	230
Lancaster	21	5	--	--	--	10	19	12	67

Table 39.--Net volume[1/] of all timber by county, species group, and diameter group (continued)

(In thousand cords)

OTHER MATERIAL

County	Yellow pines		Other softwoods		Soft hardwoods		Hard hardwoods		All species
	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	5 - 12 inches	13+ inches	
Lee	--	--	--	--	90	57	149	69	365
Loudoun	26	--	--	--	22	11	49	80	188
Louisa	90	24	--	4	114	25	103	63	423
Lunenburg	73	--	--	--	124	12	88	44	341
Madison	27	3	4	--	12	33	182	118	379
Mathews	9	3	--	--	11	12	15	2	52
Mecklenburg	39	9	--	--	102	17	44	54	265
Middlesex	21	4	--	--	12	12	29	22	100
Montgomery	84	4	3	2	24	16	113	117	363
Nansemond	--	--	--	--	44	71	74	38	227
Nelson	46	8	6	10	200	21	356	246	893
New Kent	42	14	--	--	18	23	39	43	179
Norfolk	16	5	--	--	82	60	41	7	211
Northampton	13	--	--	--	13	3	12	5	46
Northumberland	16	--	--	--	46	16	38	26	142
Nottoway	24	8	--	--	26	8	19	17	102
Orange	25	--	--	--	21	--	61	6	113
Page	30	--	7	--	3	--	31	49	120
Patrick	32	12	2	--	181	46	285	185	743
Pittsylvania	138	18	--	--	41	40	77	89	403
Powhatan	24	--	--	--	36	--	27	11	98
Prince Edward	45	5	--	--	75	10	44	71	250
Prince George	--	--	--	--	9	12	18	16	55
Prince William	39	--	--	--	31	15	25	31	141
Princess Anne	7	--	--	--	55	26	39	17	144
Pulaski	47	--	1	--	70	25	53	21	217
Rappahannock	3	--	12	--	15	18	79	47	174
Richmond	34	8	--	--	31	36	47	11	167
Roanoke	36	6	--	--	18	33	100	72	265
Rockbridge	34	17	4	--	114	34	341	319	863
Rockingham	30	18	2	--	28	28	272	353	731
Russell	--	--	1	1	32	39	54	44	171
Scott	32	--	3	15	63	114	244	311	782
Shenandoah	69	13	--	--	15	13	196	147	453
Smyth	--	--	--	--	14	26	41	76	157
Southampton	11	--	--	--	99	204	87	13	414
Spotsylvania	104	5	--	--	33	44	55	47	288
Stafford	38	--	--	--	7	16	37	28	126
Surry	5	6	--	--	13	55	57	52	188
Sussex	--	10	--	66	43	70	25	50	264
Tazewell	7	4	--	--	85	47	297	282	722
Warren	9	--	--	--	24	12	51	21	117
Washington	2	1	--	6	18	20	45	84	176
Westmoreland	50	--	--	--	7	3	19	12	91
Wise	2	--	9	--	41	114	151	201	518
Wythe	35	8	--	--	44	110	229	152	578
York	1	--	--	--	17	8	7	5	38
State total	3,731	569	188	197	4,288	3,162	10,669	8,881	31,685

1/ Sound wood and bark.

Table 40.--Average annual volume of sawtimber cut by county and species group[1/]

(In million board-feet)

County	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
Accomack	55.8	--	--	2.2	58.0
Albemarle	4.0	1.2	--	3.6	8.8
Alleghany	0.2	1.2	--	3.9	5.3
Amelia	1.6	0.9	--	--	2.5
Amherst	12.2	0.4	1.7	6.8	21.1
Appomattox	5.1	--	7.3	3.2	15.6
Augusta	--	--	4.3	22.7	27.0
Bath	--	--	--	--	--
Bedford	5.0	--	4.3	12.8	22.1
Bland	--	--	--	2.6	2.6
Botetourt	0.6	--	11.2	7.9	19.7
Brunswick	10.2	--	--	1.1	11.3
Buchanan	--	--	1.0	5.2	6.2
Buckingham	8.1	--	--	8.6	16.7
Campbell	9.4	--	3.0	4.2	16.6
Caroline	32.4	--	1.0	3.8	37.2
Carroll	0.6	16.2	--	1.4	18.2
Charles City	4.7	--	--	1.7	6.4
Charlotte	6.2	--	2.2	7.6	16.0
Chesterfield	22.9	--	1.5	14.4	38.8
Clarke	--	--	--	1.1	1.1
Craig	--	--	--	--	--
Culpeper	1.9	--	--	4.7	6.6
Cumberland	2.6	--	--	9.3	11.9
Dickenson	--	--	0.7	--	0.7
Dinwiddie	34.7	--	5.7	7.3	47.7
Essex	0.8	--	5.3	6.8	12.9
Fairfax	1.0	0.5	0.3	15.6	17.4
Fauquier	5.3	0.8	--	8.6	14.7
Floyd	0.3	5.0	1.3	7.0	13.6
Fluvanna	5.4	--	--	4.4	9.8
Franklin	6.8	1.6	4.3	9.8	22.5
Frederick	5.6	0.2	0.9	18.8	25.5
Giles	--	--	1.1	1.4	2.5
Gloucester	2.9	--	6.5	1.1	10.5
Goochland	10.8	--	4.1	4.3	19.2
Grayson	--	2.6	13.7	5.7	22.0
Greene	--	--	2.2	2.0	4.2
Greensville	34.0	--	7.6	6.3	47.9
Halifax	19.5	--	6.3	34.3	60.1
Hanover	18.9	--	12.2	1.3	32.4
Henrico	2.2	--	8.8	3.9	14.9
Henry	9.0	--	--	5.1	14.1
Highland	--	--	--	2.8	2.8
Isle of Wight	14.1	--	4.8	3.4	22.3
James City	8.9	--	2.1	10.6	21.6
King and Queen	12.7	--	--	9.8	22.5
King George	2.1	--	0.2	8.1	10.4
King William	10.3	--	1.3	7.8	19.4
Lancaster	0.9	--	0.9	7.0	8.8
Lee	--	--	--	--	--

Table 40.--Average annual volume of sawtimber cut by county and species group[1/] (continued)

(In million board-feet)

County	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
Loudoun	--	0.1	--	6.0	6.1
Louisa	6.9	--	1.1	12.8	20.8
Lunenburg	9.9	0.3	6.0	6.4	22.6
Madison	0.7	--	4.8	4.1	9.6
Mathews	14.3	--	--	--	14.3
Mecklenburg	9.2	--	1.4	16.6	27.2
Middlesex	5.3	--	--	3.4	8.7
Montgomery	--	--	--	--	--
Nansemond	15.9	--	0.9	7.9	24.7
Nelson	6.2	7.0	7.7	2.9	23.8
New Kent	31.9	--	--	5.0	36.9
Norfolk	5.3	--	3.3	26.3	34.9
Northampton	6.6	--	0.1	0.3	7.0
Northumberland	0.7	--	3.9	--	4.6
Nottoway	20.4	--	1.8	4.4	26.6
Orange	4.6	--	2.5	2.5	9.6
Page	--	--	1.3	4.9	6.2
Patrick	0.3	--	0.7	1.1	2.1
Pittsylvania	1.9	--	1.4	6.3	9.6
Powhatan	3.9	--	4.2	1.4	9.5
Prince Edward	3.9	--	--	3.2	7.1
Prince George	12.2	--	0.9	5.1	18.2
Prince William	--	--	--	9.0	9.0
Princess Anne	11.0	--	2.0	3.3	16.3
Pulaski	--	--	--	8.8	8.8
Rappahannock	0.3	--	--	1.4	1.7
Richmond	6.5	--	--	14.2	20.7
Roanoke	0.2	1.2	3.2	3.4	8.0
Rockbridge	0.2	--	--	2.6	2.8
Rockingham	--	--	--	1.1	1.1
Russell	--	--	1.5	4.4	5.9
Scott	--	1.2	2.8	5.7	9.7
Shenandoah	1.7	3.4	--	--	5.1
Smyth	0.4	1.2	1.8	0.9	4.3
Southampton	17.2	--	4.3	14.8	36.3
Spotsylvania	10.3	--	0.6	2.1	13.0
Stafford	12.4	--	2.5	22.4	37.3
Surry	11.3	--	2.6	1.7	15.6
Sussex	44.1	2.8	3.0	7.1	57.0
Tazewell	--	--	1.6	20.1	21.7
Warren	0.2	--	--	3.0	3.2
Washington	--	--	0.3	5.2	5.5
Westmoreland	1.1	--	0.3	7.2	8.6
Wise	--	--	--	0.4	0.4
Wythe	--	--	--	1.3	1.3
York	6.0	--	0.9	4.5	11.4
State total	672.7	47.8	197.2	587.2	1,504.9

1/ Estimates of timber cut by county are less accurate than inventory volumes, and use of individual county statistics should be avoided. For general use, data for a minimum of 10 counties should be combined.

Table 41.--Average annual volume of growing stock cut by county and species group[1/]

(In thousand cords)

County	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
Accomack	132	--	1	6	139
Albemarle	43	3	1	11	58
Alleghany	9	3	--	31	43
Amelia	5	2	1	--	8
Amherst	63	1	8	31	103
Appomattox	25	--	16	12	53
Augusta	--	--	10	66	76
Bath	1	--	--	1	2
Bedford	55	--	28	49	132
Bland	--	--	--	9	9
Botetourt	4	--	26	31	61
Brunswick	65	1	1	5	72
Buchanan	--	--	5	15	20
Buckingham	46	--	--	37	83
Campbell	42	--	10	13	65
Caroline	158	--	3	15	176
Carroll	3	28	1	7	39
Charles City	19	--	--	5	24
Charlotte	49	--	11	22	82
Chesterfield	86	--	19	52	157
Clarke	--	--	--	3	3
Craig	5	2	--	4	11
Culpeper	6	--	--	15	21
Cumberland	18	--	--	26	44
Dickenson	--	--	2	--	2
Dinwiddie	149	--	21	36	206
Essex	3	--	15	18	36
Fairfax	13	1	5	65	84
Fauquier	19	2	1	36	58
Floyd	3	12	4	24	43
Fluvanna	50	--	1	17	68
Franklin	46	5	17	37	105
Frederick	14	1	3	55	73
Giles	--	--	4	8	12
Gloucester	14	--	15	3	32
Gocchland	92	1	10	10	113
Grayson	--	5	33	34	72
Greene	--	--	5	5	10
Greensville	112	--	23	19	154
Halifax	96	--	24	103	223
Hanover	71	--	26	6	103
Henrico	9	--	21	11	41
Henry	41	--	--	15	56
Highland	--	--	--	9	9
Isle of Wight	42	--	14	25	81
James City	23	--	8	32	63
King and Queen	42	--	3	30	75
King George	13	--	1	22	36
King William	45	--	5	20	70
Lancaster	2	--	5	21	28
Lee	--	--	--	--	--

Table 41.--Average annual volume of growing stock cut by county and species group[1/] (continued)

(In thousand cords)

County	Yellow pines	Other softwoods	Soft hardwoods	Hard hardwoods	All species
Loudoun	--	--	--	14	14
Louisa	60	--	4	41	105
Lunenburg	55	1	20	23	99
Madison	23	--	10	13	46
Mathews	36	--	--	--	36
Mecklenburg	48	--	10	68	126
Middlesex	14	--	1	13	28
Montgomery	--	--	--	3	3
Nansemond	48	--	4	18	70
Nelson	25	13	20	10	68
New Kent	97	--	1	14	112
Norfolk	12	--	8	62	82
Northampton	17	--	2	1	20
Northumberland	2	--	10	--	12
Nottoway	78	--	11	27	116
Orange	31	--	10	14	55
Page	--	--	4	16	20
Patrick	2	--	5	19	26
Pittsylvania	62	--	6	23	91
Powhatan	30	--	10	6	46
Prince Edward	28	--	1	16	45
Prince George	48	--	5	14	67
Prince William	1	--	--	27	28
Princess Anne	30	--	6	8	44
Pulaski	--	--	--	21	21
Rappahannock	4	--	--	3	7
Richmond	26	--	2	38	66
Roanoke	3	4	11	9	27
Rockbridge	5	--	--	10	15
Rockingham	--	--	--	3	3
Russell	--	--	4	14	18
Scott	--	4	16	21	41
Shenandoah	17	6	--	1	24
Smyth	1	3	4	2	10
Southampton	49	--	24	51	124
Spotsylvania	87	--	3	9	99
Stafford	44	--	9	64	117
Surry	33	--	7	5	45
Sussex	142	5	12	20	179
Tazewell	2	--	4	59	65
Warren	2	--	--	15	17
Washington	--	--	3	14	17
Westmoreland	3	--	2	20	25
Wise	--	--	--	1	1
Wythe	--	--	--	3	3
York	15	--	3	11	29
State total	2,913	103	659	1,971	5,646

1/ Estimates of timber cut by county are less accurate than inventory volumes, and use of individual county statistics should be avoided. For general use, data for a minimum of 10 counties should be combined.

The tables which appear on the following pages have been standardized as to format and contents so that forest statistics for Virginia can be compared or combined with similar statistics for other states. This practice is being followed to provide readers with comparable data on forest area, timber volumes, growth, and timber cut for each state as the initial surveys or resurveys are completed.

Table I.--Land area by major classes of land, Virginia, 1957

Class of land	Area
	Thousand acres
Forest:	
Commercial	15,450
Noncommercial:	
Productive-reserved	260
Unproductive	404
Total forest land	16,114
Nonforest land[1/]	9,293
Total, all classes	25,407

1/ Excludes 125,000 acres classified as water by Forest Survey standards but defined by the Bureau of the Census as land area.

Table II.--Commercial forest land area by ownership and stand-size class, Virginia, 1957

(In thousand acres)

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling & sapling stands	Nonstocked & other areas[1/]
Federally owned or managed:					
National forest	1,198	502	600	62	34
Indian	--	--	--	--	--
Bur. Land Mgmt.	--	--	--	--	--
Other	190	124	53	13	--
Total Federal	1,388	626	653	75	34
State	87	51	23	10	3
County & municipal	52	33	3	16	--
Private:					
Farm	10,085	4,498	4,216	1,200	171
Wood-using industries	1,239	730	397	100	12
Other	2,599	1,066	1,182	296	55
All ownerships	15,450	7,004	6,474	1,697	275

1/ Includes areas not classified elsewhere.

Table III.--Area of commercial forest land by major forest types, Virginia, 1957

Forest type	Thousand acres
White-red-jack pine	118
Spruce-fir	--
Loblolly-shortleaf pine	2,944
Virginia pine	1,441
Oak-pine	1,406
Oak-hickory	8,553
Oak-gum-cypress	936
Elm-ash-cottonwood	--
Maple-beech-birch	52
Aspen-birch	--
Total	15,450

Table IV.--Net volume of live sawtimber and growing stock on commercial forest land by stand-size class, Virginia, 1957

Stand-size class	Sawtimber	Growing stock
	Million bd.-ft.	Million cu. ft.
Sawtimber stands	31,120	9,343
Poletimber stands	3,793	3,247
Seedling & sapling stands	224	92
Nonstocked and other areas not elsewhere classified	72	21
Total	35,209	12,703

Table V.--Net volume of live sawtimber and growing stock on commercial forest land by ownership class, Virginia, 1957

Ownership class	Sawtimber	Growing stock
	Million bd.-ft.	Million cu. ft.
Federally owned or managed:		
National forest	2,419	867
Indian	--	--
Bureau of Land Mgmt.	--	--
Other	662	212
Total Federal	3,081	1,079
State	211	92
County & municipal	176	50
Private:		
Farm	22,362	8,220
Wood-using industries	4,169	1,323
Other	5,210	1,939
Total private	31,741	11,482
All ownerships	35,209	12,703

Table VI.--Net volume of live sawtimber and growing stock on commercial forest land by species, Virginia, 1957

Species	Sawtimber	Growing stock
	Million bd.-ft.	Million cu. ft.
Softwoods:		
Shortleaf and loblolly pines	9,260	2,932
Other southern yellow pines	1,694	948
White pine	550	132
Hemlock	407	86
Cypress	228	46
Other eastern softwoods	66	42
Total softwoods	12,205	4,186
Hardwoods:		
White & swamp chestnut oaks	3,636	1,423
Other white oaks	2,399	993
Northern red, swamp red, & shumard oaks	1,766	539
Other red oaks	3,981	1,491
Yellow birch	20	10
Sugar maple	160	59
Soft maple	922	387
Beech	616	183
Sweetgum	1,532	568
Tupelo and blackgum	1,069	370
Ash	260	122
Hickory	2,177	813
Cottonwood and aspen	3	1
Basswood	213	66
Yellow-poplar	2,895	881
Black walnut	174	70
Other eastern hardwoods	1,181	541
Total hardwoods	23,004	8,517
All species	35,209	12,703

Table VII.--Net volume of live sawtimber on commercial forest land by diameter-class group and species, Virginia, 1957

(In million board-feet)

Species	Diameter-class groups						Total
	10-inch	12-inch	14-inch	16-inch	18-inch	20-inch and larger	
So. yellow pines	3,087	3,009	2,153	1,223	724	758	10,954
White pine	71	104	87	101	50	137	550
Other eastern softwoods	61	81	71	75	77	336	701
Total softwoods	3,219	3,194	2,311	1,399	851	1,231	12,205
White & swamp chestnut oaks	--	965	939	584	439	709	3,636
Other white oaks	--	620	542	364	242	631	2,399
No. red, swamp red, & shumard oaks	--	265	311	247	276	667	1,766
Other red oaks	--	912	924	664	467	1,014	3,981
Yellow birch	--	2	11	--	3	4	20
Sugar maple	--	27	39	29	19	46	160
Beech	--	72	93	90	117	244	616
Sweetgum	--	426	392	278	198	238	1,532
Tupelo & blackgum	--	240	227	231	147	224	1,069
Yellow-poplar	--	621	635	505	453	681	2,895
Other eastern hardwoods	--	1,181	1,208	861	598	1,082	4,930
Total hardwoods	--	5,331	5,321	3,853	2,959	5,540	23,004
All species	3,219	8,525	7,632	5,252	3,810	6,771	35,209

Table VIII.--Net volume of all timber on commercial forest land by class of material and species group, Virginia, 1957

(In million cubic feet)

Class of material	Total	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Saw-log portion	5,794	2,052	3,742
Upper stem portion	1,853	536	1,317
Total sawtimber	7,647	2,588	5,059
Poletimber trees	5,056	1,598	3,458
Total growing stock	12,703	4,186	8,517
Other material:			
Sound cull trees	2,132	325	1,807
Rotten cull trees	194	8	186
Hardwood limbs	646	--	646
Salvable dead trees	6	2	4
Total other material	2,978	335	2,643
Total, all timber	15,681	4,521	11,160

Table IX.--Net annual growth, annual mortality, and annual cut of live sawtimber and growing stock on commercial forest land by species group, Virginia, 1956

Item	Sawtimber			Growing stock		
	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
	Million board-feet			Million cubic feet		
Net annual growth	1,713	765	948	549	223	326
Annual mortality	256	78	178	88	32	56
Annual timber cut						
Timber products	1,472	715	757	369	200	169
Logging residues	33	6	27	43	12	31
Total cut	1,505	721	784	412	212	200

Table X.--Output of timber products and annual cut of live sawtimber and growing stock, Virginia, 1956

Product	Output of timber products					Annual cut of sawtimber			Annual cut of growing stock		
	Volume in standard units		Roundwood volume								
	Standard units	Number	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods
			Thousand cubic feet			Thousand board-feet			Thousand cubic feet		
Saw logs	M bd.-ft.[1]	1,327,593	221,523	110,213	111,310	1,180,332	542,772	637,560	247,526	116,788	130,738
Veneer logs and bolts	M bd.-ft.[1]	69,780	10,201	430	9,771	78,871	1,794	77,077	12,541	462	12,079
Cooperage logs and bolts	M bd.-ft.[1]	10,056	1,757	1,490	267	8,291	7,122	1,169	1,807	1,545	262
Pulpwood[2]	Std. cords[3]	1,629,706	110,617	85,305	25,312	168,980	136,917	32,063	86,361	65,948	20,413
Fuelwood[2]	Std. cords[4]	1,113,636	68,204	30,372	37,832	--	--	--	41,220	17,818	23,402
Piling	M linear ft.	3,143	1,820	1,454	366	12,337	9,879	2,458	1,914	1,529	385
Poles	M pieces	29	893	801	92	5,861	5,261	600	957	842	115
Posts	M pieces	5,667	4,488	2,114	2,374	2,549	1,454	1,095	3,294	1,319	1,975
Mine timbers	M cu. ft.	5,827	5,827	683	5,144	12,815	1,382	11,433	5,419	697	4,722
Miscellaneous[5]	M cu. ft.	10,477	10,477	5,383	5,094	34,864	13,919	20,945	11,161	4,952	6,209
Total	--	--	435,807	238,245	197,562	1,504,900	720,500	784,400	412,200	211,900	200,300

1/ International 1/4-inch rule.

2/ Rough wood basis.

3/ Not including 1,889 thousand cubic feet of wood from mill residues used for pulp and other fibre.

4/ Not including 17,845 thousand cubic feet of wood from mill residues used for domestic and industrial fuel.

5/ Includes excelsior bolts, handle stock, farm timbers, etc.

Table XI.--Twenty-five-year growth and volume outlook for sawtimber, growing stock, and cull timber in Virginia

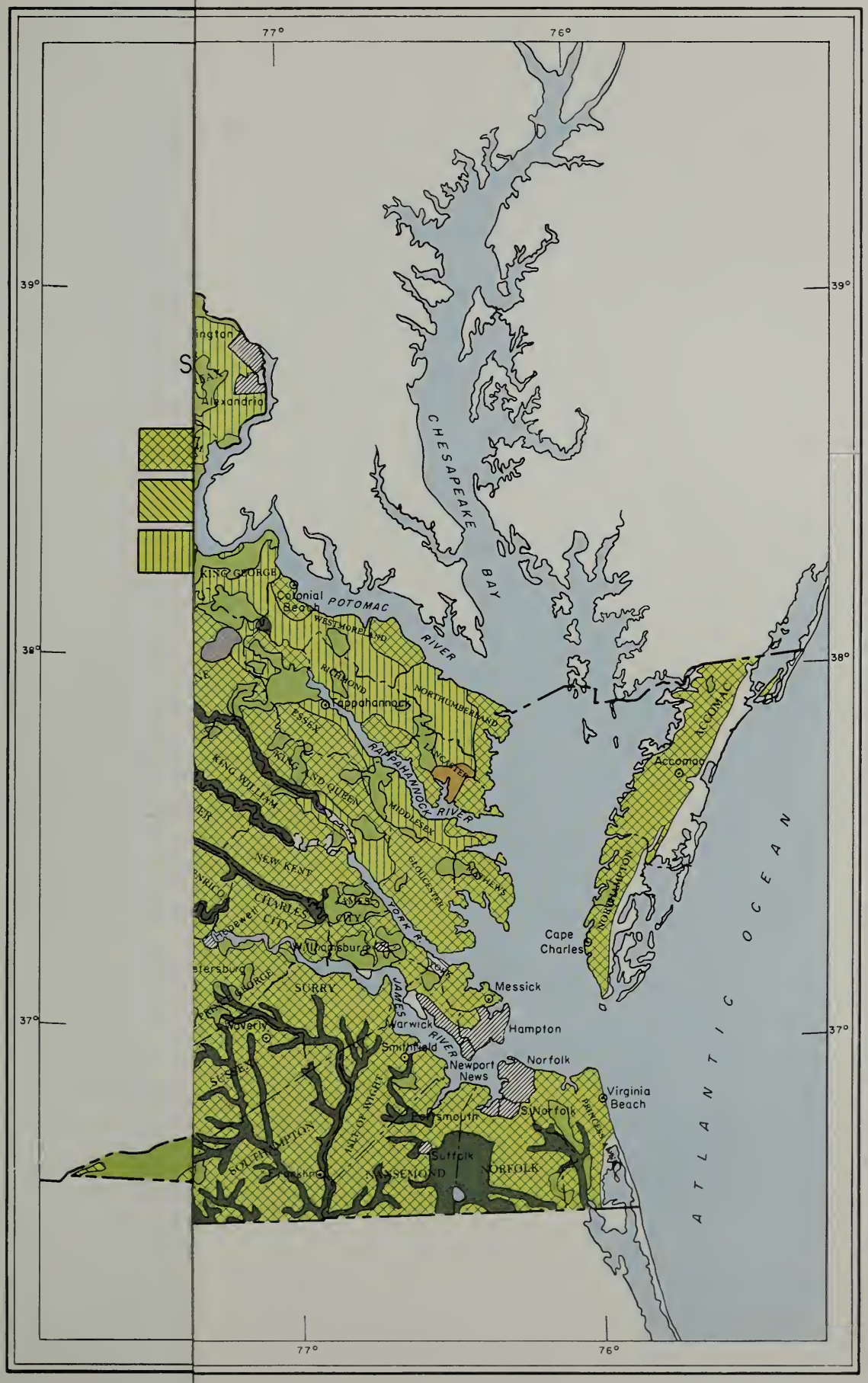
SAWTIMBER (In million board-feet)

Species group	Net annual growth		Net inventory volume		
	1956	1982[2]	1957	1982[2]	Net change
Softwoods	765	849	12,205	13,056	+851
Preferred hardwoods[3]	509	777	10,636	16,110	+5,474
Other hardwoods	439	725	12,368	18,080	+5,712
Total	1,713	2,351	35,209	47,246	+12,037
GROWING STOCK (In million cubic feet)					
Softwoods	223	234	4,186	4,543	+357
Preferred hardwoods	159	220	3,728	5,539	+1,811
Other hardwoods	167	248	4,789	7,133	+2,344
Total	549	702	12,703	17,215	+4,512
CULLS (In million cubic feet)					
All species	126	146	2,326	3,345	+1,019
ALL TIMBER (In million cubic feet)					
All species	675	848	15,029	20,560	+5,531

1/ International 1/4-inch rule.

2/ Projected growth and inventory based on continuation of current annual cut and mortality rates.

3/ Preferred hardwoods include yellow-poplar, sweetgum, white oak, black walnut, basswood, ash, northern red oak, and hard maple.


77°
76°
39°
38°
37°
CHESAPEAKE BAY
POTOMAC RIVER
RAPPAHANNOCK RIVER
YORK R.
JAMES RIVER
ATLANTIC OCEAN
Alexandria
KING GEORGE
Colonial Beach
WESTMORELAND
RICHMOND
NORTHUMBERLAND
Tappahannock
ESSEX
LANCASTER
KING AND QUEEN
KING WILLIAM
MIDDLESEX
GLOUCESTER
MATHEWS
NEW KENT
CHARLES CITY
JAMES CITY
Hopewell
Williamsburg
YORK
SURRY
Messick
Warwick
Hampton
Smithfield
Newport News
Norfolk
Virginia Beach
Portsmouth
S.Norfolk
Suffolk
ISLE OF WIGHT
ACCOMAC
Accomac
NORTHAMPTON
Cape Charles

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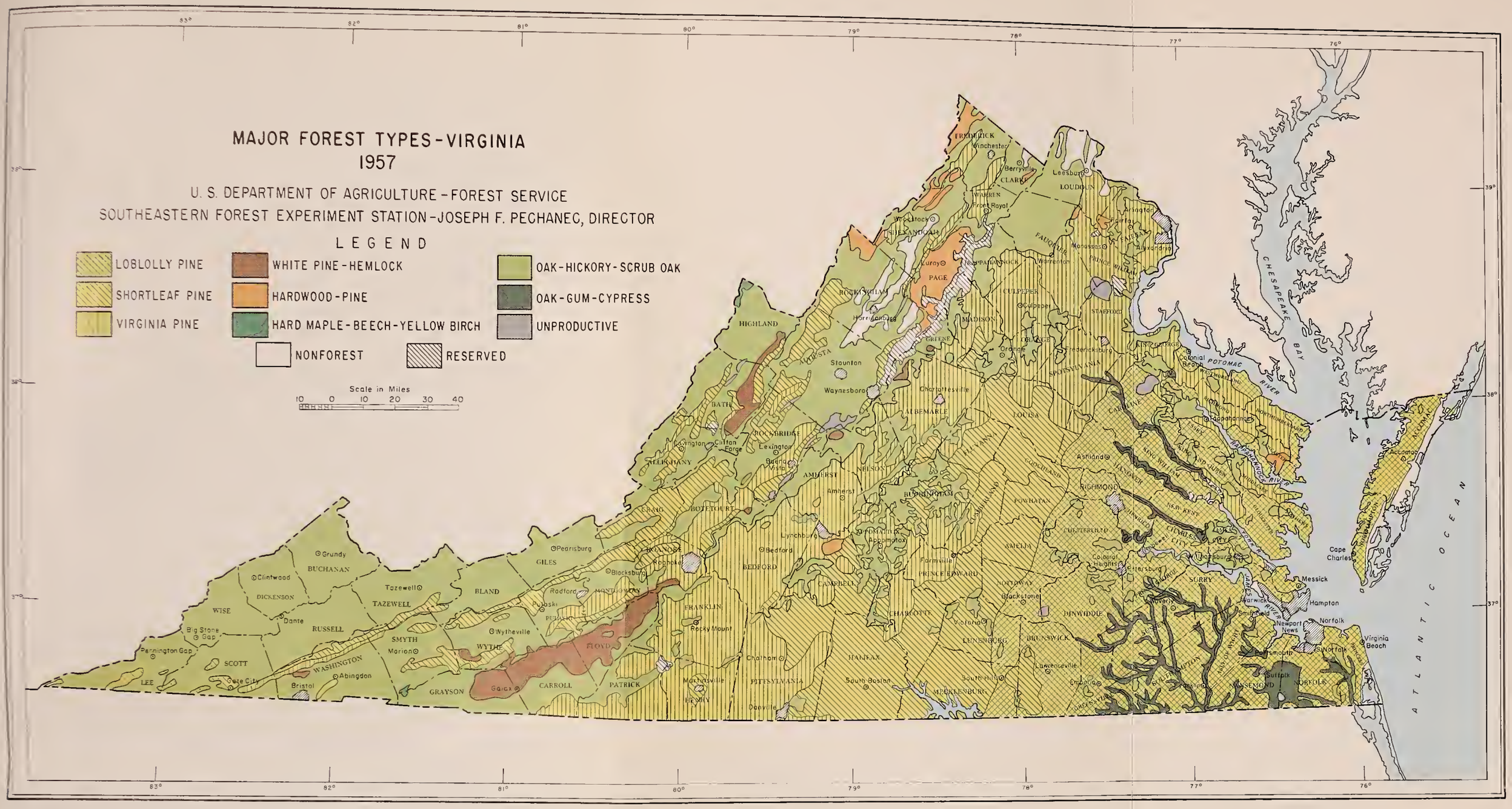
MAJOR FOREST TYPES-VIRGINIA
1957
U. S. DEPARTMENT OF AGRICULTURE-FOREST SERVICE
SOUTHEASTERN FOREST EXPERIMENT STATION-JOSEPH F. PECHANEC, DIRECTOR
LEGEND
LOBLOLLY PINE
SHORTLEAF PINE
VIRGINIA PINE
WHITE PINE-HEMLOCK
HARDWOOD-PINE
HARD MAPLE-BEECH-YELLOW BIRCH
NONFOREST
RESERVED
OAK-HICKORY-SCRUB OAK
OAK-GUM-CYPRESS
UNPRODUCTIVE
Scale in Miles
10 0 10 20 30 40
CHESAPEAKE BAY
ATLANTIC OCEAN
POTOMAC RIVER
RAPPAHANNOCK RIVER
JAMES RIVER
FREDERICK
Winchester
Berryville
CLARKE
Leesburg
LOUDOUN
WARREN
Front Royal
Woodstock
SHENANDOAH
Luray
PAGE
RAPPAHANNOCK
Warrenton
FAUQUIER
Manassas
Fairfax
Arlington
Alexandria
PRINCE WILLIAM
CULPEPER
Culpeper
STAFFORD
ROCKINGHAM
Harrisonburg
MADISON
GREENE
ORANGE
Orange
Fredericksburg
KING GEORGE
Colonial Beach
HIGHLAND
AUGUSTA
Staunton
Waynesboro
Charlottesville
SPOTSYLVANIA
CAROLINE
Fappahannock
BATH
ALBEMARLE
LOUISA
ROCKBRIDGE
Lexington
Buena Vista
Covington
Clifton Forge
ALLEGHANY
AMHERST
NELSON
Amherst
BUCKINGHAM
GOOCHLAND
Ashland
HANOVER
RICHMOND
KING WILLIAM
NEW KENT
CHARLES CITY
Accomac
ACCOMAC
Cape Charles
CRAIG
BOTETOURT
Lynchburg
APPOMATTOX
Appomatox
POWHATAN
CHESTERFIELD
Colonial Heights
Petersburg
Williamsburg
SURRY
Messick
Hampton
Norfolk
Virginia Beach
Newport News
Smithfield
Warwick
Waverly
DINWIDDIE
SUSSEX
SOUTHAMPTON
Suffolk
NORFOLK
NANSEMOND
Portsmouth
Norfolk
Emporia
Lawrenceville
BRUNSWICK
Blackstone
NOTTOWAY
AMELIA
Farmville
PRINCE EDWARD
CAMPBELL
BEDFORD
Bedford
Pearisburg
GILES
Blacksburg
Roanoke
ROANOKE
Rocky Mount
FRANKLIN
Chatham
PITTSYLVANIA
Danville
Martinsville
HENRY
HALIFAX
South Boston
CHARLOTTE
Victoria
LUNENBURG
South Hill
MECKLENBURG
Lawrenceville
BRUNSWICK
Emporia
GREENSVILLE
Grundy
BUCHANAN
Clintwood
DICKENSON
Dante
WISE
Big Stone Gap
Pennington Gap
SCOTT
Gate City
LEE
RUSSELL
TAZEWELL
Tazewell
BLAND
Radford
Pulaski
MONTGOMERY
Wytheville
WYTHE
FLOYD
SMYTH
Marion
WASHINGTON
Abingdon
Bristol
GRAYSON
Galax
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